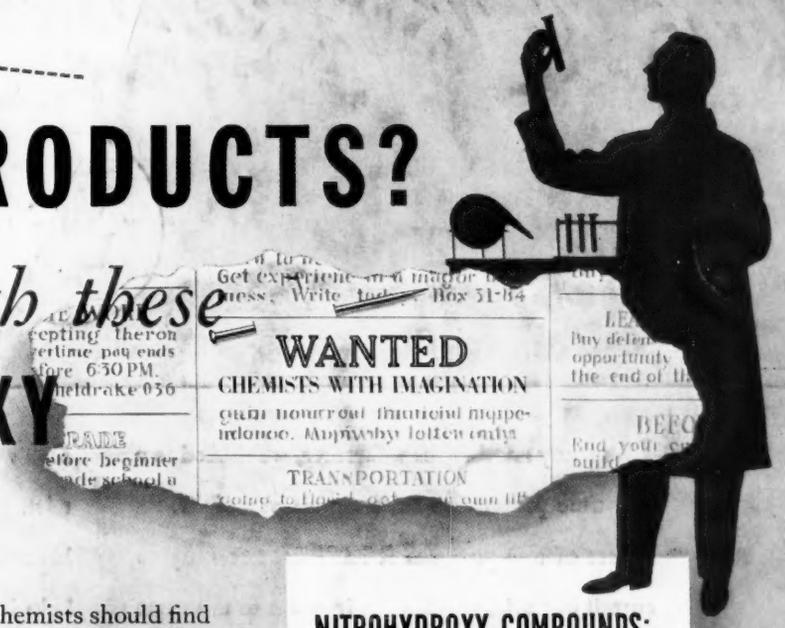
No. 6

CHEMICAL INDUSTRIES

The Chemical Engineering Magazine

WANT NEW PRODUCTS?

...try syntheses with these NITROHYDROXY ALIPHATICS



Among this group of Nitrohydroxy Compounds your chemists should find just the starting material needed to develop valuable new products. The number and wide variety of reactions which are suggested by their chemical structure promise an almost endless number of new synthetic chemicals. Results obtained in our own and other laboratories are confirming the prediction that the compounds already produced are only the forerunners of thousands to come.

If your chemists are not yet working with these NP derivatives, call their attention to the unusual possibilities of these new chemicals. We will gladly send samples and a copy of our 40-page Data Book, "The Nitroparaffins — New Worlds for Chemical Exploration." Why not request one of our technical men to call and discuss these and the other NP derivatives?

NITROHYDROXY COMPOUNDS:

$$\begin{array}{l} NO_2 \\ | \\ CH_3\text{-}C\text{-}CH_2OH \\ | \\ CH_3 \end{array}$$

2-NITRO-2-METHYL-1-PROPANOL

$$\begin{array}{l} NO_2 \\ | \\ CH_2OH\text{-}C\text{-}CH_2OH \\ | \\ CH_3 \end{array}$$

2-NITRO-2-METHYL-1,3-PROPANEDIOL

$$\begin{array}{l} NO_2 \\ | \\ CH_2OH\text{-}C\text{-}CH_2OH \\ | \\ C_2H_5 \end{array}$$

2-NITRO-2-ETHYL-1,3-PROPANEDIOL

$$\begin{array}{l} NO_2 \\ | \\ CH_2OH\text{-}C\text{-}CH_2OH \\ | \\ CH_2OH \end{array}$$

TRIS(HYDROXYMETHYL)NITROMETHANE

$$\begin{array}{l} NO_2 \\ | \\ CH_3\text{-}CH_2\text{-}C\text{-}CH_2OH \\ | \\ H \end{array}$$

2-NITRO-1-BUTANOL

17 EAST 42nd STREET, NEW YORK, N. Y.

FOR VICTORY
BUY UNITED STATES SAVINGS BONDS AND STAMPS

How The Solvay Sales Force Is Helping The War Production Program

★ ★ ★ ★ ★ ★ ★ ★

Like many another manufacturer, we shifted to a war time production basis almost overnight. As a part of this program it has been necessary to curtail our sales solicitation in order to use some of our salesmen for other duties.

Other Solvay salesmen have taken over the work of those men who have been transferred. In addition, sales calls of Solvay salesmen have been "pooled" wherever possible in order that more territory can be covered with limited use of automobiles.

Perhaps, for the time being, a "new" Solvay face will be making sales contacts in your district. You can rest assured that this man knows his business . . . that he will try to be of utmost help in solving your problems.

In return for the extra hours these men are now putting in, would you try to make your Solvay salesmen's calls as effective as possible—to your advantage and to his—by promptly giving him the time he needs . . . even thinking ahead of time how you and he can work best together to save just a little more time for some other customer's problem?

SOLVAY SALES CORPORATION

Alkalies and Chemical Products Manufactured by The Solvay Process Company

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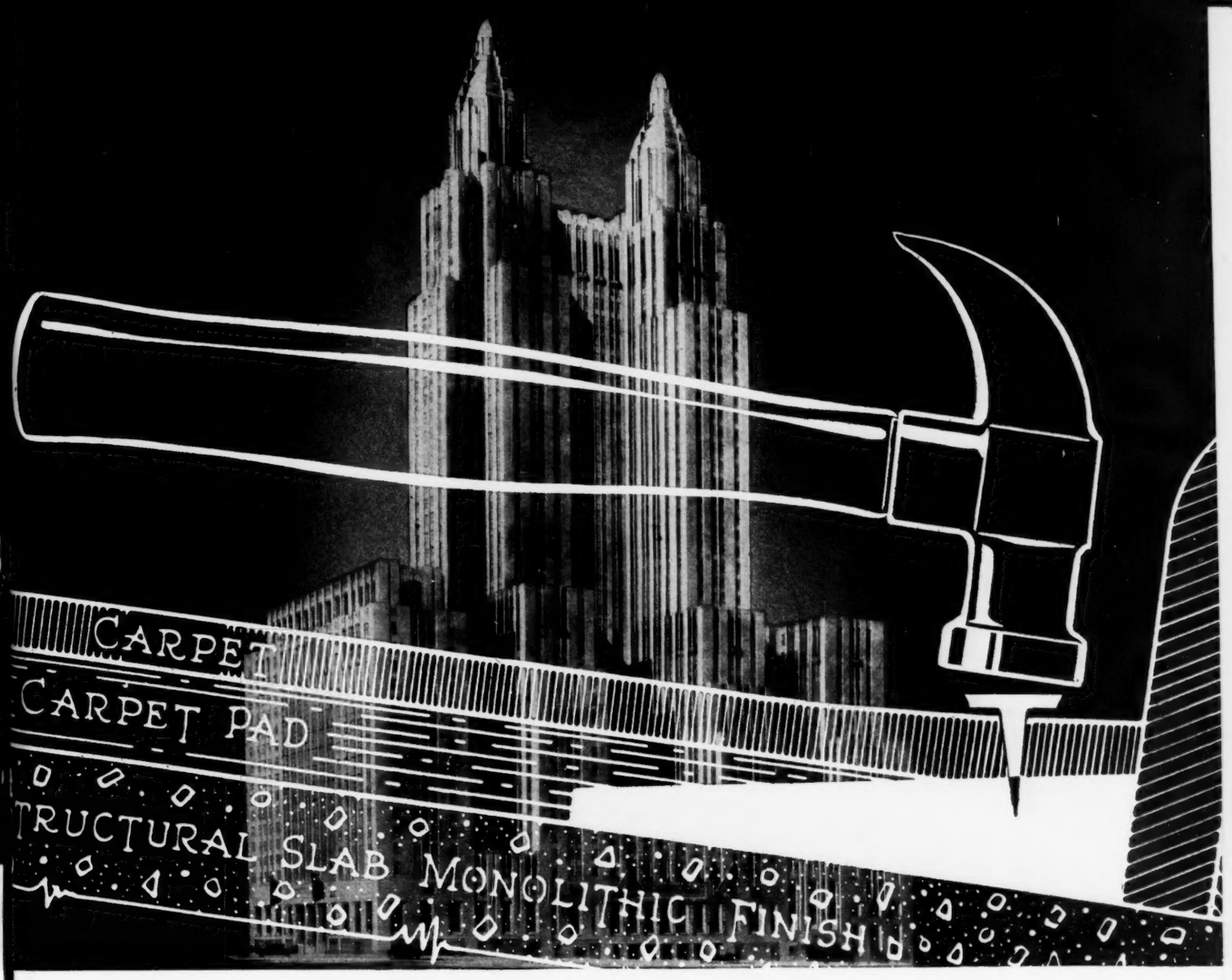
Ammonium Bicarbonate · Ammonium Chloride · Calcium Chloride · Causticized Ash · Salt · Sodium Nitr



These "SLEEPERS" *Checked in Before the Waldorf Opened!*

On concrete floors of the Waldorf Astoria and many another modern hotel are "sleepers" . . . nailing strips of lightweight Oxychloride Cement that hold carpeting nails in a vice-like grip. In hotels, institutions, public and office buildings wherever fire safety is absolutely necessary . . . these man-made "chemical" nailing strips are widely used.

Used also as flooring, Oxychloride Cement is not only spark-proof but also drains off the build-up of static electricity . . . valuable properties in explosive plants, on ships and in chemical plants.

Oxychloride Cement is one of the many interesting "Chemicals from Seawater" on which we will gladly supply technical data.

WARNER CHEMICAL COMPANY

Division of WESTVACO CHLORINE PRODUCTS CORPORATION

CHRYSLER BUILDING, NEW YORK, N. Y.

CHICAGO, ILL. · GREENVILLE, S. C. · NEWARK, CAL.

The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

Contents

Volume 50 Number 6

JUNE, 1942

Editorials 755

Feature Articles

New Aspects of Research and the Law: The New Food, Drug and Cosmetic Act By H. A. Toulmin, Jr. 758
Lime as a Chemical Raw Material (Part II—Conclusion) By Wallace E. Wing. 760
The American Balance Sheet in Oils and Fats (Part III—Conclusion) By Walter J. Murphy 768
Between the Lines—The Vitamins 778

New Chemicals for Industry

How to Buy Substitutes By E. Rosendahl 788
Foreign Literature Digest By T. E. R. Singer 790
Industry's Bookshelf 790
New Products and Processes By James M. Crowe 792
Laboratory Notebook 794

Plant Operation and Management

Maintenance of Motors in the Chemical Industry By W. W. McCollough and H. E. Dralle 796
New Equipment 800
Plant Operations Notebook 801
Packaging and Container Forum By R. W. Lahey 803

Chemical Specialties

Automobile Cleaners and Polishes By C. T. Small, Ph. D. 806
Chemical Specialty News 810

News of the Month in Review

Washington By T. N. Sandifer 730
Chemogram (Digest of Last Minute News) Insert between 730-731
General News 819
Chemical News in Pictures 779, 811
Canadian Review By Kenneth R. Wilson 829
Review of the Markets By Paul B. Slawter, Jr. 830
Prices Current 836
Booklets and Catalogs 853

Part 2: Statistical and Technical Data Section

Current Statistics—Business Trends 859
Chemical Stocks and Bonds—Chemical Finance 861
Trademarks 863
Government Regulations 865
U. S. Patents, Foreign Patents 867

(Index to Advertisements . . . Page 856)

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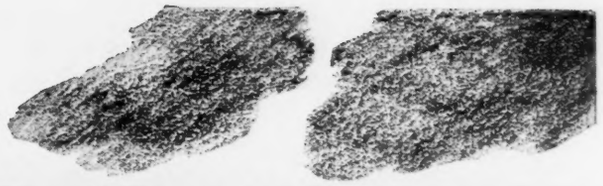
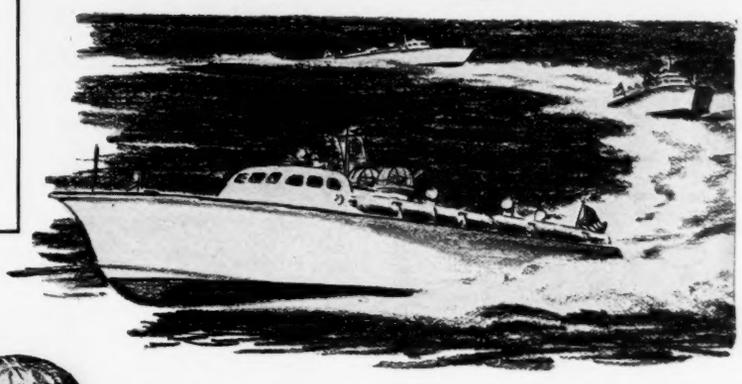
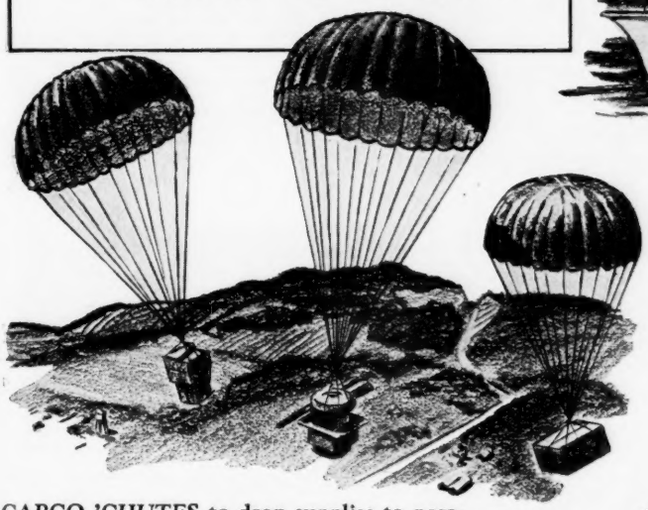
Caustic Soda *helps speed America's War Effort!*





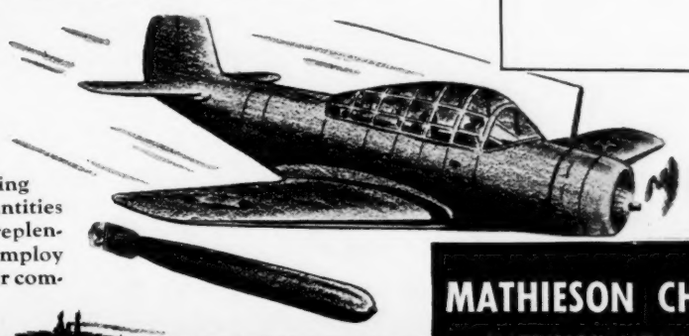
"PT" BOATS clip the waves at 70 miles per hour! Speed is their chief defense. If their powerful engines fail in battle—they are dead ducks! To assure trouble-free timing, ignition systems are insulated with phenolic resins—the best non-conductor yet devised. In the synthesis of phenol by the sulfonation process, caustic soda is an essential raw material.



CARGO 'CHUTES to drop supplies to paratroops or isolated garrisons are now being made of rayon. Although still in the experimental stage, rayon promises to replace other fabrics which are needed for parachutes that carry human cargoes. Largest U.S. user of caustic soda, the rayon industry produces rayon cord for tires...high-tenacity fabric for self-sealing gasoline tanks.

BIG GUNS that can tear a tank to shreds ride on tires that are part new, part reclaimed rubber. In reclaiming rubber from used tires, caustic soda is used to dissolve the cord fabric, thus separating it from the rubber which is to be reworked.

UNCLE SAM'S "Battlewagons" pack a lethal wallop with their bristling batteries of 16-inch rifles. Breeches are loaded with smokeless powder neatly stitched in silk bags. In the manufacture of smokeless powder, caustic soda is used to purify the cotton linters.



TORPEDO PLANES are poison to enemy warships. Whether based on land or sea-roving carriers, U.S. warplanes burn staggering quantities of lubricants and high octane gasoline. In replenishing vital supplies of fuel, oil refineries employ caustic soda to remove objectionable sulphur compounds from petroleum products.

MATHIESON CHEMICALS

THE MATHIESON ALKALI WORKS, (INC.)

60 E. 42ND STREET, NEW YORK, N. Y.

LIQUID CHLORINE . . . SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . BLEACHING POWDER . . . HTH PRODUCTS . . . AMMONIA, ANHYDROUS and AQUA . . . FUSED ALKALI PRODUCTS . . . SYNTHETIC SALT CAKE . . . DRY ICE . . . CARBONIC GAS . . . SODIUM CHLORITE PRODUCTS

THE READER WRITES

Alcohol From Sulfite Waste

I think your flow sheets on page 225, February issue, should contain sulfite waste liquor as a source of alcohol. This is now used for alcohol production in Sweden and Finland.

If the sugars in the effluents of sulfite mills in Oregon and Washington were fermented to alcohol, the production of alcohol would amount to 71,500 gallons per day.

H. K. BENSON,
Executive Officer,
Dept. of Chemistry and Chemical Engineering,
University of Washington,
Seattle, Wash.

Suggests Improvement On Features

May I commend the very excellent articles, well illustrated and with plentiful number of flow sheets, that you are placing in your magazine? These are all quite useful to myself and my assistants.

However, when you publish an article in two parts, it would be helpful if, under Part 2 you would give references to the appropriate pages wherein you had published Part 1. This will help the use of your magazine.

R. NORRIS SHREVE,
Professor of Chemical Engineering,
Purdue University,
Lafayette, Ind.

Editorial Note: This excellent suggestion has been adopted in this issue.

Not For Teachers? Certainly It Is!

CHEMICAL INDUSTRIES is not published for teachers so teachers should have little to say about what should be included. I do enjoy reading CHEMICAL INDUSTRIES because it keeps me informed of current trends in the industry, economic as well as technical. For courses in general or industrial chemistry a great deal of valuable reference material is found in the magazine.

C. M. LOUCKS,
University of Tulsa,
Tulsa, Okla.

List Feature Articles

I suggest that you either abstract briefly or list (giving title and author) leading articles appearing in outstanding technical publications, such as Rubber Age, India Rubber World, Industrial & Engineering Chemistry, "Chem & Met," etc.

ROBERT J. KEATING,
Boston, Mass.

●

Priorities
Allocations
Price Controls

●

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. Invaluable to you in your work.

Calendar of Events

June 18, New England Paint & Varnish Production Club, Hotel Vendome, Boston, Mass.

June 18-20, The National Fertilizer Association, 18th Annual Convention, The Homestead, Hot Springs, Va.

June 21-25, American Water Works Assoc. Annual Convention, The Stevens Hotel, Chicago, Ill.

June 22-26, American Society for Testing Materials, 45th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

July 2, Indianapolis Paint, Varnish & Lacquer Assoc. Regular Monthly Meeting, Columbia Club, Indianapolis, Ind.

July 22-24, American Society of Civil Engineers, Annual Convention, Spokane, Wash.

July 27, Association of Consulting Chemists & Chemical Engineers, Inc. Council Meeting, The Chemists' Club, New York, N. Y.

Aug. 6, Indianapolis Paint, Varnish & Lacquer Assoc. Regular Monthly Meeting, Columbia Club, Indianapolis, Ind.

Aug. 17, Utah Paint, Varnish & Lacquer Ass'n Monthly Meeting, Salt Lake City, Utah.

Production Drive drawing, made by Garrett Price to symbolize the might of the American worker, will be made into posters. Write to the Production Drive Headquarters, War Production Board, Washington, D. C., for similar ideas and assistance in boosting plant output.

TANNING IN 1568

THE simple beam house operation shown here, which removes hair and epidermis from hides by "scraping with a knife on a beam" is still used in tanneries.

Unlike the "dehairing" operation, processes for tanning itself have advanced considerably in the last 50 years. Possibly the greatest single achievement was the invention of Chrome Tanning in 1884. This made possible a quicker and more economical tanning process. Of principal importance in the tanning of upper shoe leathers, Chrome tanning is a basic factor in the production of shoes of today. Mutual Bichromate of Soda has been used by leading tanners since the inception of Chrome Tanning.

MUTUAL CHEMICAL CO. OF AMERICA NEW YORK N.Y.

Mutual Chemical Co of America

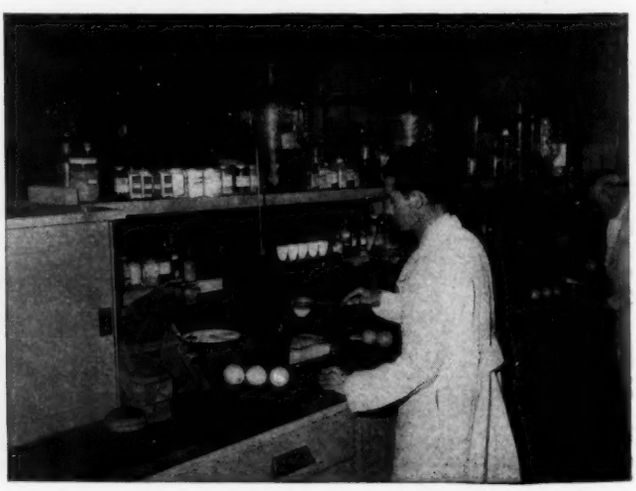
270 MADISON AVENUE, NEW YORK

Life On The

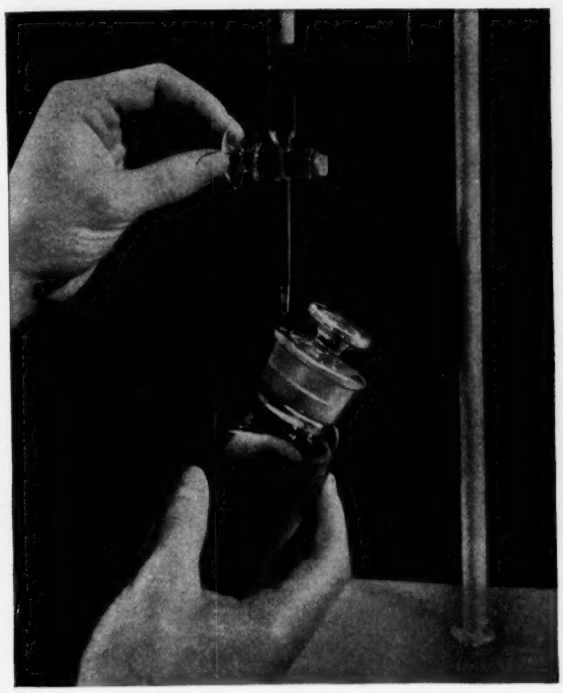
(*Left*) **NEW LIGHT ON PLANT GROWTH** has resulted from research work carried on by researchers at the University of California. Radioautograph (first to be made of carbon) shows leaves of a sunflower plant that was exposed to radioactive carbon in complete darkness. Distribution of the carbon throughout the leaves substantiates the research workers' contention that plants can absorb carbon in the dark. In another phase of this work, these investigators discovered valuable information on the whole process of photosynthesis, by which plants convert water and carbon dioxide into carbohydrates and free oxygen. Previously accepted theory held that the carbon dioxide and water were first converted into formaldehyde and oxygen under the influence of chlorophyll, and that formaldehyde molecules then combined to form glucose. In their approach to the problem of photosynthesis, the California men concentrated on the source of the oxygen freed. They obtained heavy oxygen, and experimented with photosynthesis using heavy-oxygen water and ordinary carbon dioxide; then with ordinary water and heavy-oxygen carbon dioxide. These experiments showed that all of the oxygen freed came from the water, none of it from the carbon dioxide.

(*Below*) **RECONDITIONED GOLF BALLS** will see service on many a course this summer. At the plant of a Chicago firm, "unplayable" balls get a new lease on life. They receive new outer covers and windings, and then are sprayed with a durable coat of paint. In normal times Cyanamid's alkyd resins might well be employed in surface coatings for such uses where hardness, elasticity, durability, and color retention must be combined. Because of their unusual properties, the alkyd resins are filling many of the Country's war production needs.

(*Below*) **THE FLAVOR'S SEALED IN** when fresh fruits and vegetables are treated by a new process developed by A. F. Kalmar and M. L. Hewitt of the Food Machinery Corporation. Fruits are coated with special waxy solutions that restrict the pore openings, preventing excessive loss of moisture and vitamin qualities, and helping to preserve color and flavor of the treated fruits for long periods of time. Photograph shows chemists Kalmar and Hewitt performing laboratory tests on the waxy solutions to which the new flavor-sealing process owes its efficacy.



Chemical Newsfront



(*Above*) **GLASS STOPPERS ARE EASILY REMOVED** from bottles when a few drops of AEROSOL* are released from a burette around the edges of the stopper. The AEROSOL quickly penetrates between stopper and neck of bottle, and breaks the friction that causes sticking. Care should be taken to remove the AEROSOL from the stopper, to keep it from coming into contact with the contents of the bottle. This is one of the many novel applications of the unusually effective AEROSOL Wetting Agents.

(*Above*) **FASTER BLUEPRINTING** without sacrifice of background is made possible by incorporation of Cyanamid's Guanidine Nitrate in the blueprint paper coating. This new development represents another Cyanamid contribution that assists the makers and users of blueprint paper, who have already benefited by Cyanamid's introduction of REDSOL** CRYSTALS to replace Red Prussiate of Potash.

(*Right*) **SPACE-SAVING BOATS** for Navy use are constructed of rubber for compact storage when not in use, can be quickly inflated when needed. This is a typical instance of the new ways in which rubber products are serving the nation's needs—ways which frequently involve new compounding problems for the rubber manufacturer. Cyanamid serves the rubber industry with many essential chemicals, including AERO* Brand Acrylonitrile, for the manufacture of synthetic rubber; AERO Brand DPG, DOTG, Rubber Sulphur, and AERO AC 50**, a delayed action activator for the thiazole type of accelerators.

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA · NEW YORK, N. Y.

*Reg. U. S. Pat. Off.

WASHINGTON

By T. N. Sandifer

WITH the vacation season on, current and impending Federal gas and tire conservation moves have taken on new implications. However, these steps are creating much more of a national upheaval even, than is realized over the country.

The three factors in the present stringency are all related, but it has not been made clear in Washington the order in which they are related. Thus, it is still a moot subject as to whether gas rationing of motorists in the 17 unfortunate eastern states which initiated the conservation program was an indirect effort to save tires, or sprung from conditions within the gas industry. In turn there is the third factor, of direct interest to the chemical industry, of synthetic rubber production. National rationing of gas may be an actuality before this appears, as it is at this writing scheduled for early operation. However, the proposals have had such widespread repercussions, even in Congress, that the whole question of gas rationing, tires and synthetic rubber has assumed political aspects.

T. N. Sandifer

The importance attached in Washington to the political possibilities in this nationally irritating situation, is indicated by the action of the White House on two occasions; one, when the President indicated that consideration was again being given a coast-to-coast pipeline, and again, when he allowed some optimistic views on the prospect for new rubber supplies to become known. Obviously these emanations from such an authoritative source were of a nature to quiet public clamor, whether intended so or not.

The imminent shortage of "tires in being" meanwhile, with veiled threats from various Washington sources to seize not only tires but autos, to meet defense needs, has spot-lighted the programs, for whatever they may be worth, intended to produce synthetic rubber. Here again, the characteristic confusion of utterance in Washington has not helped, and the average person over the country is as much in the dark as ever, as to whether there is actually going to be any synthetic rubber, after reading conflicting statements.

Like gas rationing, the rubber program has been haggled into political wrangling, with the obvious lack of any going production being used first, as a basis for an attack by certain Washington elements on Secretary of Commerce Jones, who as a Texas banker, and conservative old-line Southern Democrat, naturally gets no New Deal bouquets anyway.

From this question as to who is to blame for the absence of synthetic rubber supplies in the first place, the debate in Congress has veered to why industrial alcohol producers, making this essential ingredient of synthetic rubber, have refused to use grain, and following that question, a fight over charges that the program to make synthetic rubber has been focused in a monopoly of large rubber companies.

The special Senate Committee investigating charges that alcohol producers were refusing to use surplus grain has a number of members who have expressed sympathy with the idea that WPB industrial alcohol men, as well as those in the Rubber Reserve Company, the agency established to promote rubber production, are basically inimical to any extensive rubber program. Any charge that concealed industrial interests are hampering such an effort is of course, a magnet for certain members of Congress, some of whom are undoubtedly sincere, even if mistaken.

The actual fact is that some time ago the Rubber Reserve Company, and the Defense Plan Corporation, two Federal emergency agencies under Secretary of Commerce Jones, made contracts with some 25 of what were described in the announcement as "the principal oil, chemical and rubber manufacturing companies" of the country, to bring into operation over the next 18 months, rubber production facilities which it was estimated would furnish annually, more than 700,000 tons.

Mention of any specific figure of rubber production is open to challenge, as even in Washington, there is no general agreement in public announcements, as to what actual production can be expected. Furthermore, there is no unanimity as to when this rubber will be available.

As to the essential alcohol component for its manufacture, the War Production Board has announced that 200,000,000 gallons of butadiene will be allotted for rubber manufacture, out of a total alcohol production in sight for the remainder of this year and 1943, of 590,000,000 gallons.

Incidentally, the WPB stated "practically all this production will be made from grain." The total will be contributed by various sources; the seaboard industrial alcohol plants are down for 160,000,000 gallons, similar plants in the New Orleans area, which will utilize blackstrap because of its availability there, will furnish 65,000,000. A similar amount is scheduled from ethylene gas production. The remainder will come from converted beverage alcohol distilleries and foreign sources, including Cuba and Mexico.

Out of the mass of conflicting statements in Washington then, it is possible only to say that an attempt to produce synthetic rubber is under way, and because of public demand, is certain to be pushed. It is also known that a number of plants, in addition to those primarily engaged by the Government for the purpose, are to have some share in the effort. A full list of such auxiliary-producing units has not been disclosed yet, and is said to be confidential for military reasons.

The consensus, however, is that adequate supplies of synthetic rubber cannot be counted on in time to meet the current tire situation, and it may be pointed out, future military contingencies may absorb all of such new production whenever it is available. Meantime, if gas continues scarce in many parts of the country, the current tire equipment of the nation's cars will be conserved, whether or not that was the real purpose of gas rationing.

Secretary Ickes has revived his project for a coast-to-coast pipeline, but there is little prospect at this stage that he will get it. What appears to be a likely compromise is an auxiliary, shorter line, connecting Gulf Coast gas-producing areas with the southern terminus of inland water routes leading to the Eastern area.

Meanwhile, other Government actions

(*Continued on page 732*)

WESTWARD HO! Out across the prairies from the last outposts of civilization the wagon trains of the pioneers stretched a course of progress that did much to extend and consolidate the growth of our nation. It was this spirit of enterprise, banding together the resources, courage and skill of able, sincere and purposeful people, that has made our nation truly great.

THE HISTORIC COURSE OF PROGRESS...

FROM CURRIER & IVES, BY HARRY T. PETERS, REPRINTED BY PERMISSION FROM DOUBLEDAY, DORAN AND COMPANY, INC

The uniting of the Niagara Alkali Company and the Electro Bleaching Gas Company marks a similarly able, sincere and purposeful endeavor. Now, as one unified source of supply, Niagara Alkali Company will be able to serve important chemical needs of American Industry on an expanded scale to traditional quality standards.

Niagara
ALKALI COMPANY
60 EAST 42nd STREET, NEW YORK, N. Y.

CAUSTIC POTASH · CAUSTIC SODA
PARA · CARBONATE OF POTASH
Liquid Chlorine

EBG NIAGARA ALKALI COMPANY

LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON PRICES PRODUCTION PERSONNEL

MCA Meets in New York

Seventieth Annual meeting of the Manufacturing Chemists Association, held in New York June 4, was the best attended on record. Because of heavy responsibilities on chemical executives in the war production program, the meeting was for one day only and devoted entirely to business meetings. A number of military and War Production Board men were present to take part in the discussion of problems relating to all-out chemical production for war. Officers elected at the meeting were: President, H. L. Derby, American Cyanamid & Chemical Corp.; Vice-Presidents, George W. Merck, Merck & Co. and Charles Belknap, Monsanto Chemical Co.; Treasurer, J. W. McLaughlin, Carbide & Carbon Chemicals Corp.; Secretary, Warren N. Watson. Members of the executive committee: Lammot du Pont, of E. I. du Pont de Nemours & Co., Chairman; E. M. Allen, Mathieson Alkali Works; Leonard T. Beale, Pennsylvania Salt Manufacturing Company; Russell H. Dunham, Hercules Powder Company; C. F. Hosford, Jr., Pennsylvania Coal Products Company; H. O. C. Ingraham, General Chemical Company; August Kochs, Victor Chemical Works; Clyde D. Marlatt, the Martin Dennis Company; Charles S. Munson, U. S. Industrial Chemicals, Inc.; T. P. Walker, The Commercial Solvents Corporation; Howard I. Young, American Zinc, Lead & Smelting Company. Speakers at the meeting included Dr. Neil Carothers, Dean of the College of Business Administration of Lehigh University; Dr. E. W. Reid, chief of the Chemicals Branch of the WPB; Dr. D. P. Morgan, deputy chief; Dr. W. G. Whitman, assistant chief, Dr. H. F. Coith, also assistant chief and Dr. E. W. Weidlein, technical adviser to the WPB and The Rubber Reserve Co.

WANTED—CHEMICAL MANUFACTURERS:—One of the armed services is seeking chemical manufacturers for the manufacturing of sulfur trioxide solution in chlorosulfonic acid (FS) Spec. 96-31-52; titanium tetrachloride (FM) smoke, and chloracetyl chloride, an ingredient for the manufacturing of chloracetophenone (CN). Only manufacturers will be considered; packaging concerns will not be considered. Bonafide chemical manufacturers are requested to address their inquiries in writing (do not call in person or telephone) to their nearest WPB Contract Distribution office.

PERSONNEL:—The Francis P. Garvan Gold Medal honoring women in chemistry has been awarded to Dr. Florence B. Seibert, associate professor of biochemistry at the Henry Phipps Institute of the University of Pennsylvania, for "distinguished work on the chemistry of tuberculosis." The medal will be presented to Dr. Seibert at the Society's 104th national meeting, to be held in Buffalo, N. Y., September 7 to 11. Dr. Seibert, who isolated the active substance in tuberculin, widely used in the detection of tuberculous infection in man and animal, and prepared the International Standard Tuberculin, is a "recognized expert in her field." . . . Richard F. Bergmann has been appointed chief engineer for Link-Belt Company . . . William W. Sayers, who has served in that position since 1925, has been appointed consulting engineer. In this newly created position he will continue to deal with patent matters and be available for consultation where his extensive knowledge of the company's engineering problems will be helpful . . . Harry C. Beaver has been elected president of the Worthington-Gamon Meter Co. to succeed the late E. T. Fishwick. Mr. Beaver is also president of Worthington Pump and Machinery Corp. R. R. Anderson, treasurer and manager of Worthington-Gamon Meter Co. has been elected vice president and director, as well as retaining his office as

treasurer . . . John W. Boyer, formerly chief of the alkalies unit and the compressed gas unit of the chemicals section of OPA, is now acting chief of the acids, salts, and gases unit of the inorganic section of the chemical branch of WPB . . . Dr. John H. Highberger, of the Tanners Council, Research Laboratory, University of Cincinnati, elected president of American Leather Chemists Association at thirty-ninth annual meeting in Columbus, Ohio . . . F. C. Baselt appointed manager of research of Atlantic Division of American Can Co.

AICHE CONVENTION:—1943 spring meeting of the American Institute of Chemical Engineers tentatively set for New York City.

FERTILIZER CONVENTION:—Eighteenth Annual convention of The National Fertilizer Association being held at Hot Springs, Va., June 18, 19, and 20. Board of Directors meeting will be on Thursday. Several government officials will speak along with John A. Miller, president of the Association, Dr. Clarence Poe, editor of the Progressive Farmer and Dr. Edward C. Elliott, president of Purdue University.

COLLOID SYMPOSIUM:—American Chemical Society and National Research Council jointly holding the Nineteenth Colloid Symposium at Boulder, Colorado, June 18 to 21. An outstanding group of scientists will participate. Sessions will be devoted to discussions of apparatus and techniques used in colloidal chemistry, including applications of the electron microscope in this field, studies on colloidal electrolytes, rubber latex, blood plasma, dyes, hay fever, leaf pigments, and soybean proteins.

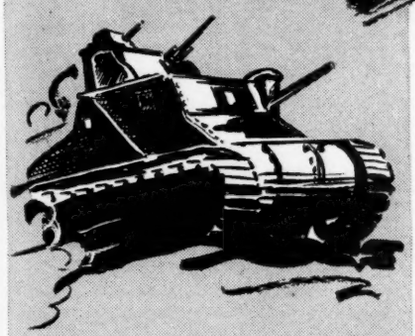
ALCOHOL PRICES:—Maximum prices for alcohol anti-freeze will be established by the OPA by mid-June at levels substantially below those now charged by some manufacturers according to Price Administrator Henderson. As now contemplated, the regulation will hold manufacturers' prices to levels perhaps as low as 69 cents a gallon for high-cost-production alcohol anti-freeze delivered by the carload in drums, container included. Schedule will also include ethylene glycol anti-freezes.

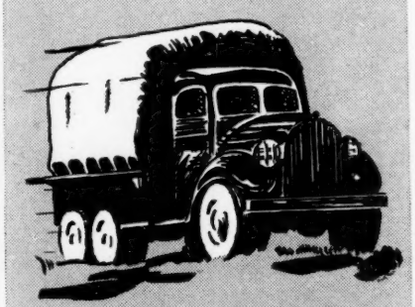
RUBBER:—Humble Oil & Refining Co. will construct two plants for the Government in connection with the synthetic rubber program. Investment by both Humble and Government to total about $43,000,000 . . . Five hundred and twenty acres of nursery beds at Salinas, Calif. have been planted from guayule seed acquired from the Intercontinental Rubber Co. The Department of Agriculture said that this total of twenty-one thousand lbs. of seed will provide enough seeding plants for about fifty thousand acres of field plantations next winter.

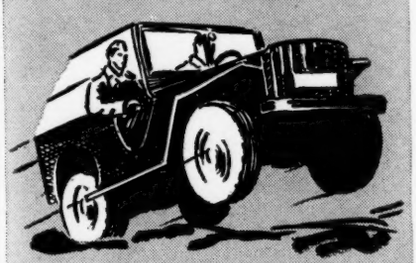
EXPLOSIVE MAKERS INDICTED:—A federal grand jury has indicted six explosives manufacturers and ten of their officials on charges of conspiring to fix prices in violation of the Sherman Anti-Trust Act. Companies named were: Atlas Powder Co., Austin Powder Co., E .I. du Pont de Nemours & Co., Hercules Powder Co., Illinois Powder Manufacturing Co., and King Powder Co. The indictment contended that effect of the alleged conspiracy was "to maintain the prices of commercial explosives and blasting supplies to all classes of consumers at high, arbitrary and artificial levels."

FORM CHICAGO A. I. C. CHAPTER:—Following preliminary meeting held in Chicago on May 27 presided over by Dr. Gustav Egloff, newly elected president of the American Institute of Chemists, a meeting will be held June 19, Huylers Restaurant, 310 S. Michigan Ave. to formally install officers and outline program of organization and future meetings.

AROPLAZ 1323







AN IMPROVED ALKYD FOR HOLABIRD QUARTERMASTER DEPOT SPECIFICATION HQD-ES NO. 680

This pure alkyd resin, of specified composition to meet all phases of this government requirement, demands very careful balance and control to obtain simultaneously the needed drying time, flexibility, resistance and low final paint cost.

AROPLAZ 1323 Solution (50% solids in Mineral Spirits) has been designed just for that purpose and has the following constants:

Acid No.	**3-5**
Color	**5-12 (G-H)**
Viscosity	**Z1-Z-3 (G-H)**
Wt. per gallon @ 20°C	**7.7 lbs.**

Samples and additional data are available.

STROOCK & WITTENBERG CORP.

60 East 42nd Street, New York, N. Y.

PROTECTION AGAINST PROFIT LEAKS

Many a manufacturer, after adopting Bemis Waterproof Bags, has found the answer to costly, annoying profit leaks. Replacements and allowances for loss of quality and quantity in transit and storage—loss of customers through dissatisfaction—these and many other profit leaks have been overcome by shipping in Bemis Waterproof Bags.

These Bemis shipping containers can be made to keep moisture in and dampness out—retain desirable aromas and repel objectionable odors—shut out dust and dirt—resist acids and grease. And the strength and toughness of Bemis Waterproof Bags provide extra protection against rough handling.

WATERPROOF DEPARTMENT

BEMIS BRO. BAG CO.

ST. LOUIS, MO. • BROOKLYN, N. Y.

Washington

(*Continued from page 730*)

were taking place on the chemical front; further priority assistance was assured vital chemical war industries in an amendment to General Preference Order P-89, upping the preference ratings to be applied to certain essentials for these industries.

At the same time, reflecting the rubber situation, WPB barred, in amendment to M-124, the use of bare rubber thread and covered rubber thread of size 60 or coarser, in manufacture of a number of health and medical articles.

The WPB has placed under strict allocation control all butyl alcohol to assure supplies for both munitions and essential plastics use. Earlier it took similar action respecting distribution of naphthalene in Order M-105, and the refractory, Indian kyanite, in M-143. Changed preference ratings were announced in amendment to M-41, for all permitted uses of chlorinated hydrocarbon, the order remaining in effect until revoked, whereas it would have expired in mid-May.

A brief review of highlight actions in Washington in recent weeks shows the following:

OPA permission to New York agent of Netherlands government in London to sell a specified lot of fully refined paraffin wax at a price which includes extra expenses involved due to war.

Naphthenates and naphthenic acid placed under strict use and allocation control by WPB in Order M-142.

Limited use of high lauric acid oils in food products permitted during this summer, due to tendency of soybean oil and other substitutes for oils now restricted to war use, to grow rancid. Amendment to Order M-60.

Inventory restrictions on phosphate rock removed by WPB, in Order M-149 to permit consumers to take advantage of transportation facilities when available.

Use of cashew nut shell oil for use in brake linings barred except to Army and Navy, in Order M-66 amendment.

Production of anti-freeze to be placed on quota approximating 50 per cent of amount sold by each producer in 1941, by Order L-51; WPB.

Amendment to L-113 by WPB prohibiting use of any finishing material for pencils, containing any pigments other than carbon black, lamp black, bone black, white, domestic earth colors, and ultramarine blue.

Woodpulp Price Regulation No. 114 amendment by OPA to permit woodpulp manufacturers to base ceilings on a price FOB producer's mill on sales to persons other than consumers or their vendors.

Sperm oil placed under complete allo-

(*Continued on page 834*)

RELY ON DOW

for Caustic Soda

IMPORTANT FACTORS TO GUIDE USERS OF THIS ESSENTIAL PRODUCT

WHAT ARE THE REASONS why users of Caustic Soda place their reliance on Dow? Under present pressing industrial conditions it is important to know, for greater consideration must now be given to certain factors than ever before. It is pertinent therefore to emphasize the following facts:

DEPENDABLE SOURCES

Dow has developed *several* sources for the production of Caustic Soda. Users of this Dow product are not dependent on one source only.

GEOGRAPHICAL LOCATION

Dow sources are geographically located to reduce the distance between production centers and industrial users—always an important factor in the distribution of a highly essential bulk product.

AVAILABILITY

Thus Dow is in a strong position to make Caustic Soda speedily available to industry in all parts of the United States.

EXPERIENCE and FACILITIES

Dow has had long years of experience in producing Caustic Soda and in developing production processes. Each of its plants is completely equipped. Facilities are unsurpassed.

QUALITY

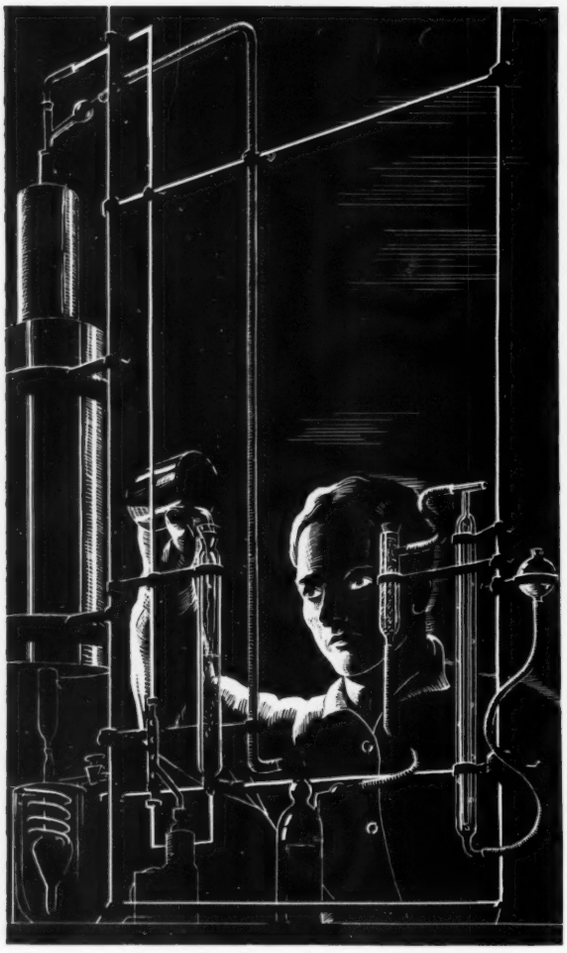
Dow is supplying a substantial portion of the nation's Caustic Soda requirements because the high quality and uniform excellence of its product are thoroughly established. It is dependable.

From every standpoint, you can rely on Dow.

DOW

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Chicago • St. Louis • San Francisco • Seattle • Los Angeles • Houston



POLYMERIZATION, ISOMERIZATION, ALKYLATION, HYDROGENATION, DEHYDROGENATION, DEHYDRATION, SULPHURIZATION, NITRATION, CHLORINATION, FLUORINATION AND OXIDATION

Try Harshaw chemicals in your process. Many of the materials listed have been produced in Harshaw's plants for many years, others have been added to meet the ever-increasing requirements of industry. Production and control facilities are geared to war-time needs, with ample space for further expansion.

Harshaw can supply you with chemicals for experimental work, pilot plant and large-scale production—a pound or a carload.

Anhydrous Hydrogen Chloride
Anhydrous Hydrogen Fluoride
Aluminum Chloride
Aluminum Nitrate
Aluminum Oxide
Antimony Oxide
Boron Tri-Fluoride
Cadmium Carbonate
Chromium Fluoride
Chromium Formate
Chromium Nitrate
Cobalt Acetate
Cobalt Carbonate
Cobalt Chloride
Cobalt Formate
Cobalt Nitrate
Cobalt Phosphate
Cobalt Sulphate
Copper Acetate
Copper Carbonate
Copper Chloride
Copper Formate
Copper Nitrate
Copper Oxide
Copper Phosphate
Copper Sulphate
Magnesium Nitrate
Manganese Acetate
Manganese Carbonate
Manganese Chloride
Manganese Phosphate
Manganese Sulphate
Nickel Acetate
Nickel Carbonate
Nickel Chloride
Nickel Fluoride
Nickel Formate
Nickel Nitrate
Nickel Sulphate
Silver Chloride
Silver Cyanide
Silver Nitrate
Stannous Chloride
Stannous Sulphate
Zinc Acetate

THE HARSHAW CHEMICAL CO.

Cleveland, Ohio, and Principal Cities

Quick Delivery

OF THESE IMPORTANT CHEMICALS

Want action? A wire or letter today will get it for you. Stocks of Emery Stearic Acids (all grades) and Emery Hydrogenated Fish Oil Fatty Acids are ready for immediate shipment. Address the nearest of the offices listed below.

Emery Stearic Acids

Laboratory-controlled quality. For use in lubricating compounds, waterproofing cements, candles, buffing compounds, cosmetics, pharmaceuticals, dyestuffs, polishes, paints, printing inks and stearates.

Emery Hydrogenated Fish Oil Fatty Acids

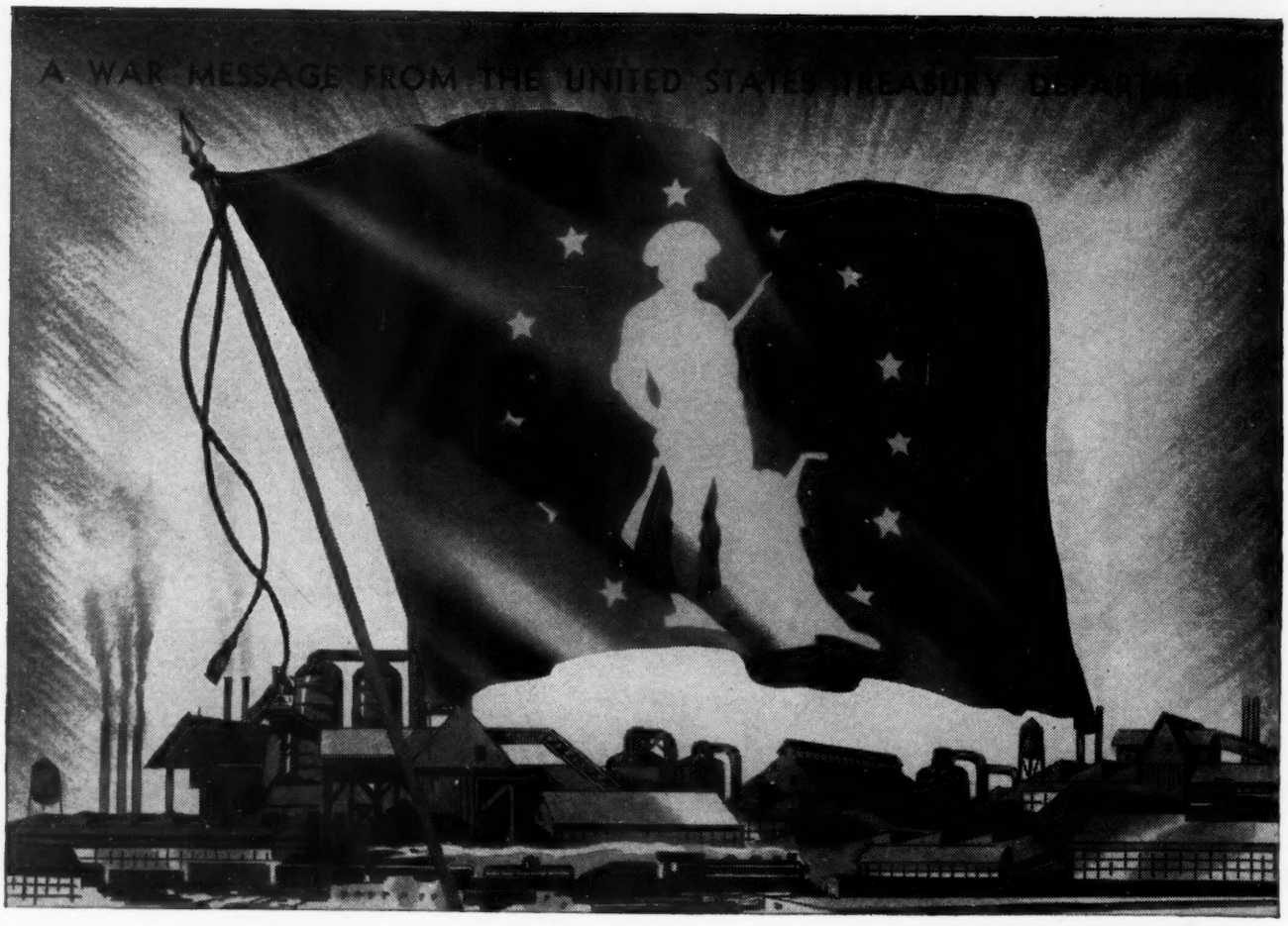
Absolutely uniform quality. For rubber compounding, buffing compounds, and the manufacture of stearates.

This device is a promise to you (and a reminder to us) that every Emery product must behave as specified. Complete tests and analyses *at every stage of manufacture* assure a conspicuous absence of variation in the finished product. Whether you are Uncle Sam or just Mr. Sam, you can count on Emery chemicals to do their jobs.

EMERY INDUSTRIES

INCORPORATED CINCINNATI, OHIO

New England Office, 187 Perry Street, Lowell, Massachusetts • New York Office, 1336 Woolworth Bldg., New York, N. Y.



Next to the Stars and Stripes . . .

AS PROUD A FLAG AS INDUSTRY CAN FLY

Signifying 90 Percent or More Employee Participation in the Pay-Roll Savings Plan

IT doesn't go into the smoke of battle, but wherever you see this flag you know that it spells Victory for our boys on the fighting fronts. To everyone, it means that the firm which flies it has attained 90 percent or more employee participation in the Pay-Roll Savings Plan . . . that their employees are turning a part of their earnings into tanks and planes and guns *regularly,* every pay day, through the systematic purchase of U. S. War Bonds.

You don't need to be engaged in war production activity to fly this flag. Any patriotic firm can qualify and make a vital contribution to Victory by making the Pay-Roll Savings Plan available to its employees, and by securing 90 percent or more employee participation. Then notify your State Defense Savings Staff Administrator that you have reached the goal. He will tell you how you may obtain your flag.

If your firm has already installed the Pay-Roll Savings Plan, now is the time to increase your efforts: (1) To secure wider participation and reach the 90-percent goal; (2) to encourage employees to increase their allotments until 10 percent or more of your gross pay roll is subscribed for Bonds. "Token" allotments will not win this war any more than "token" resistance will keep our enemies from our shores, our homes. If your firm has yet to install the Plan, remember, TIME IS SHORT.

Write or wire for full facts and literature on installing your Pay-Roll Savings Plan now. Address Treasury Department, Section D, 709 12th St., NW., Washington, D. C.

Make Every Pay Day "Bond Day"

U. S. **WAR Bonds ★ Stamps**

This Space is a Contribution to Victory by **Chemical Industries**

U. S. GOVERNMENT PRINTING OFFICE 16—27879-1

Form No. DSS-BP-4

★ America's all-out Victory Program requires ever-increasing quantities of coal-tar chemicals for which Barrett is a key source of supply—

Toluol for TNT . . . *Benzol* for Tetral ...*Phenol* for picric acid...*Anhydrous Ammonia* for nitric acid and ammonium nitrate...*Phthalic Anhydride* for di-butyl phthalate for smokeless powder —also for ship, tank and truck finishes... *Hydrogenated Products* to improve performance of lubricating oils . . . *Pyridines* for sulfa drugs . . . *Quinoline* for vitamins . . . *Tar Acids* for plastics, disinfectants and pharmaceuticals . . . *Rubber Compounding Products* for extending the vital rubber supply . . . *Cumar** for waterproofing tarpaulins, tenting and other military fabrics . . . *Naphthalene* and *Cresol* for insulating materials for military cable . . .

Because these and other chemicals are so vital to winning the war, we ask the indulgence of our customers in civilian industries if deliveries are delayed. Barrett's vast facilities and 88 years of manufacturing experience are being utilized to keep production at top limits.

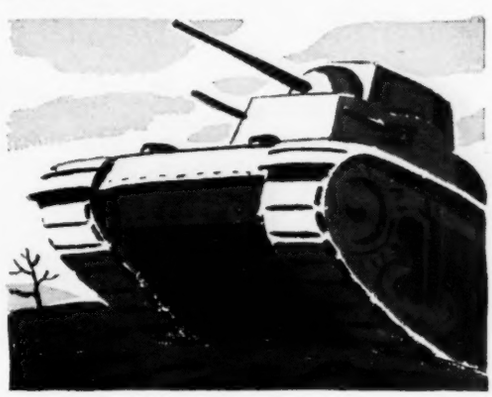
★ ★ ★ ★ ★ ★ ★ ★

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK
BARRETT CHEMICALS

Tar Acids
Phenols
Cresols
Cresylic Acids
Naphthalene
Phthalic Anhydride
*Cumar (Paracoumarone-Indene Resin)
Rubber Compounding Materials
Bardol*
Barretan*
Pickling Inhibitors

Benzol
Toluol
Xylol
Solvent Naphtha
Hi-Flash Solvent
Hydrogenated Coal-tar Chemicals
Flotation Agents
Tar Distillates
Anhydrous Ammonia
Sulphate of Ammonia
Arcadian* the *American* Nitrate of Soda

*Reg. U. S. Pat. Off.

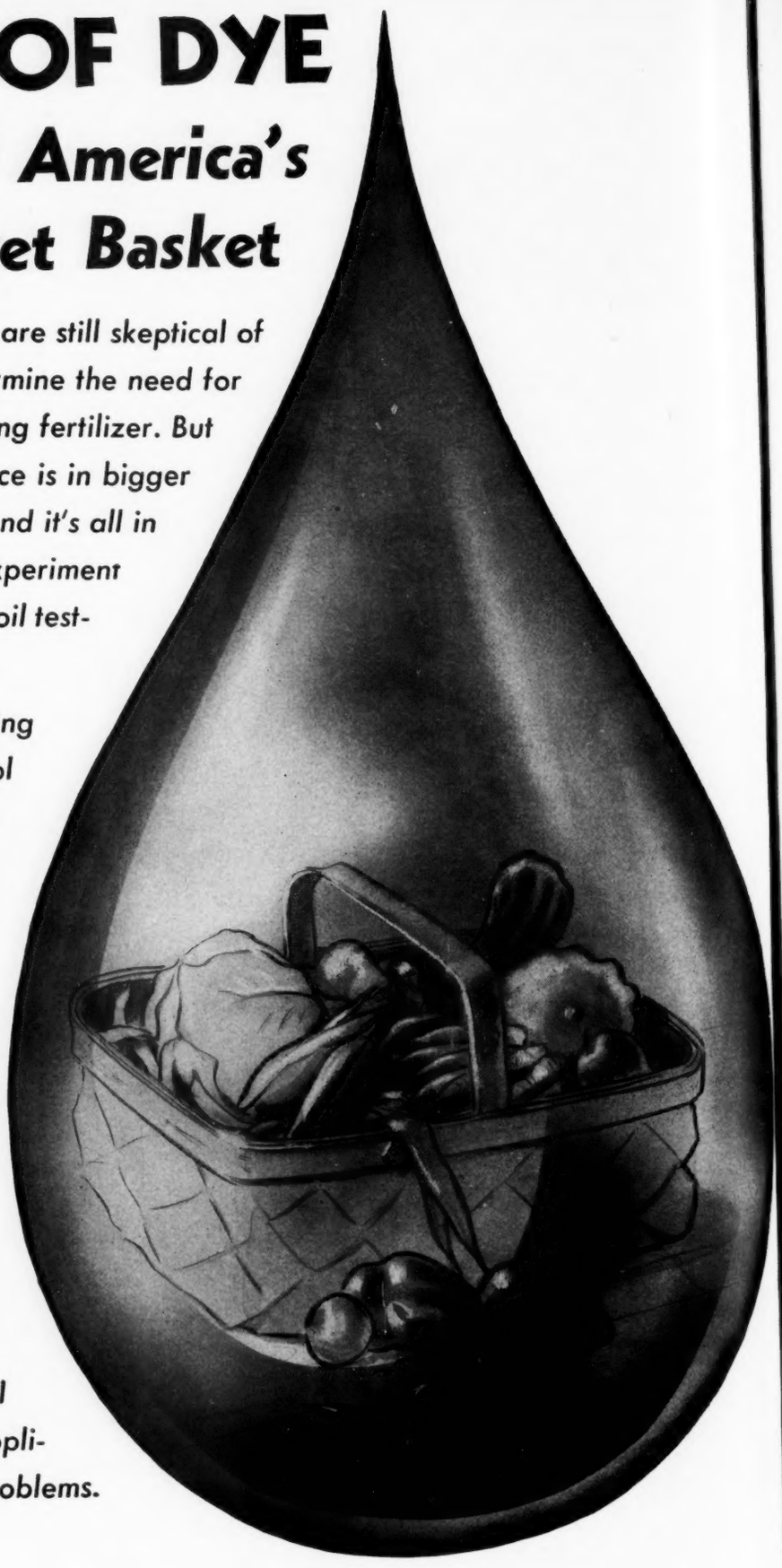


A DROP OF DYE
Helps To Fill America's Market Basket

"Dirt farmers" are still skeptical of pH tests to determine the need for liming soil and using fertilizer. But the practical evidence is in bigger and better crops . . . and it's all in favor of Agricultural Experiment Stations which have made soil testing an exact science.

Active ingredients in soil-testing kits are Brom-Thymol Blue, Cresol Red and other National dyes. Only a few drops are needed to make a soil-test solution but since every dye for this purpose must be exceptionally pure, these specialized types are made in National's Pharmaceutical Laboratories.

National Research and National Technical Service are constantly expanding the application of our basic production of dyestuffs, intermediates and synthetic organic chemicals. National Technical Service can help you in their application to your specific problems.



NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET **NEW YORK, N. Y.**

BOSTON	150 Causeway St.	SAN FRANCISCO	517 Howard St.	NEW ORLEANS	Masonic Temple Bldg.
PROVIDENCE	15 Westminster St.	CHARLOTTE	201-203 W. First St.	CHATTANOOGA	James Bldg.
CHICAGO	357 W. Erie St.	GREENSBORO	Jefferson Standard Bldg.	PORTLAND, ORE.	730 West Burnside
PHILADELPHIA	200-204 S. Front St.	ATLANTA	140 Peachtree St.	TORONTO	137-145 Wellington St., W.

BRANCHES AND DISTRIBUTORS THROUGHOUT THE WORLD

Announcing the

DU PONT ELECTROCHEMICALS DEPARTMENT

formerly

THE R. & H. CHEMICALS DEPARTMENT

With the same products... the same policies... the same personnel you have known in the past.

As of JUNE 1, 1942, The R. & H. Chemicals Department of Du Pont will be designated as the Du Pont Electrochemicals Department. This involves no change in the products you use, the policies you know or the people who serve you. The same experienced group of chemists, engineers and others will continue to further your interests through research, development, control, service and production. The development of new and better chemicals will remain a primary objective.

The products of the Electrochemicals Department will be, as before, a line of specialized chemicals derived principally from salt. In addition, it will continue to manufacture other specialties such as formaldehyde and its derivatives, polyvinyl alcohol, polyvinyl acetate, and ceramic colors and decorations.

The products of the Du Pont Electrochemicals Department are important in practically all branches of industry:

Chlorinated Solvents—for dry-cleaning, metal degreasing, extraction of oils and many other uses.

Peroxides—for bleaching, pharmaceutical and cosmetic preparations, general oxidation purposes.

Cyanides—for steel treating, electroplating, metal cleaning, fumigation, organic synthesis.

Refrigerants—for domestic and commercial refrigeration units.

Sodium, 99.9%—reactive chemical for industrial and laboratory work.

Formaldehyde and its Derivatives—for plastic manufacture; disinfecting; embalming fluid, treating paper, leather, textiles; chemical synthesis.

Electroplating Chemicals and Processes—for decorative and protective coatings on metal parts.

Ceramic Materials—for manufacture and decoration of glass, china, tile, terra cotta, porcelain.

Miscellaneous Chemicals—for Plating, Refrigeration, Plastics, Ceramics, Extermination, Rubber, Textile, Leather, Paper, Pharmaceutical and Process Industries.

Our Technical Service will continue to cooperate with you in every way possible. You may find it even more helpful in today's emergency. Technically-trained men are at your service with the practical experience necessary to answer your questions on the use of specialties and specialized electrochemicals. They are ready to work with you in your plant or in our research laboratories.

DU PONT
REG. U. S. PAT. OFF.

Established 1802

E. I. du Pont de Nemours & Company, (Inc.)
Wilmington, Delaware

E-Z Seal lever locking ring drum.

The Answer

to the container problem for chemicals

Steri Seald

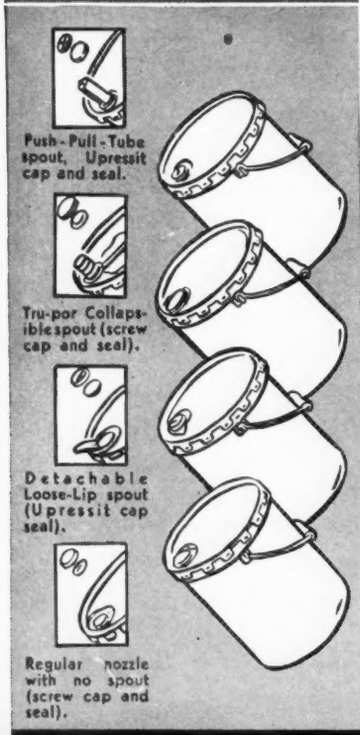
TRADE MARK REG. U. S. PATENT OFFICE

LINED STEEL CONTAINERS

RECENT developments in linings for steel drums and pails, by our research laboratory, now make it possible to offer an economical, tested, lined steel container for many chemical products that in the past have not enjoyed this type of packaging.

If you manufacture chemical products, that are classified under essential preference ratings, we would welcome an opportunity to work with you in developing a suitable lined steel container.

WILSON & BENNETT MANUFACTURING COMPANY
6532 S. Menard Ave., Chicago, Ill.



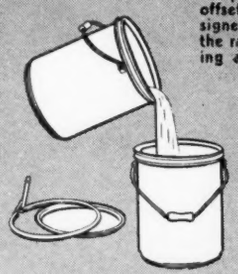
Push-Pull-Tube spout, Upressit cap and seal.

Tru-por Collapsible spout (screw cap and seal).

Detachable Loose-Lip spout (Upressit cap seal).

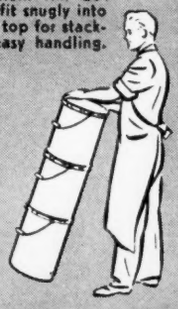
Regular nozzle with no spout (screw cap and seal).

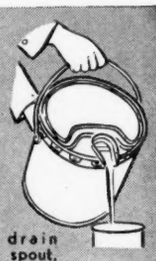
Lug covered drum. Complete opening lug covers can be supplied.



E-Z Seal lever locking ring pail.

All pails are made with offset bottom rim designed to fit snugly into the raised top for stacking and easy handling.





Full drain swivel spout, lug covered, por-pail.

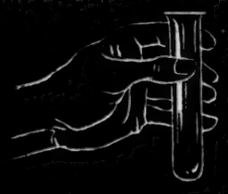
WILSON & BENNETT MANUFACTURING CO., CHICAGO, ILL.

Subsidiary of Inland Steel Company

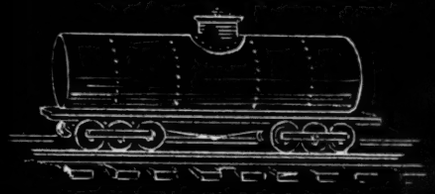
Plants at Chicago, Jersey City and New Orleans ● Sales offices in principal cities

Makers of Steel Drums and Pails

FROM TEST TUBE



TO TANK CAR



It may take anywhere from five to fifteen years for a new chemical to advance from test tube to tank car — from the laboratory into volume production for commercial use.

Post-war conditions are likely to call for widespread utilization of chemical products that now are still in the test tube stage. Because of this, research at

HOOKER

is being accelerated, laboratory facilities have been modernized and expanded, new chemical developments are "in the works". Now is the time for you to call in HOOKER research men to consult with your chemists so that you may solve today your problems of tomorrow.

HOOKER

ELECTROCHEMICAL COMPANY

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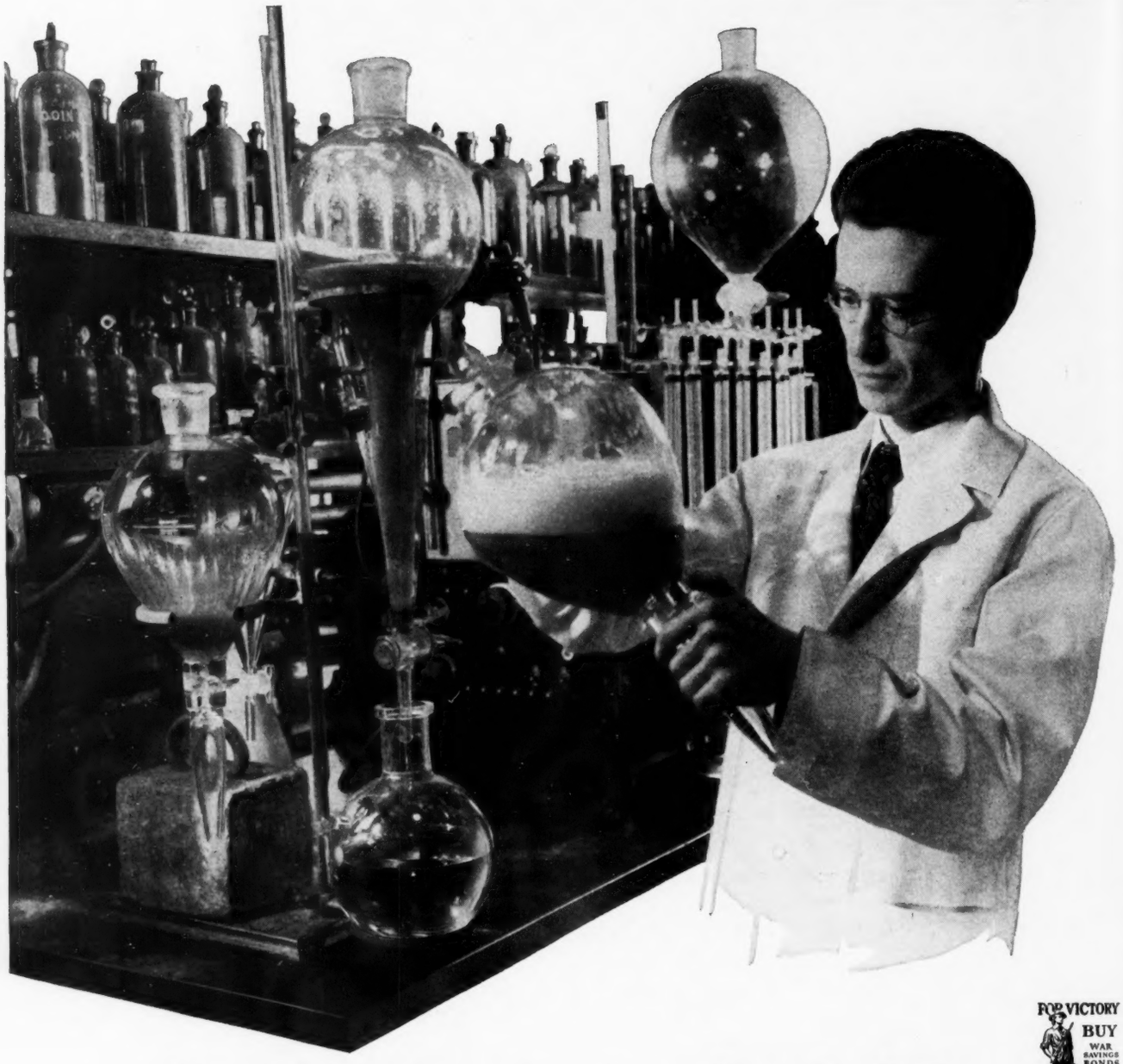

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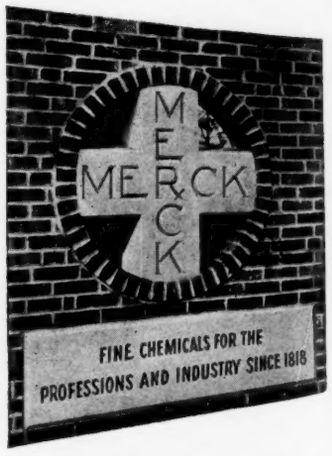

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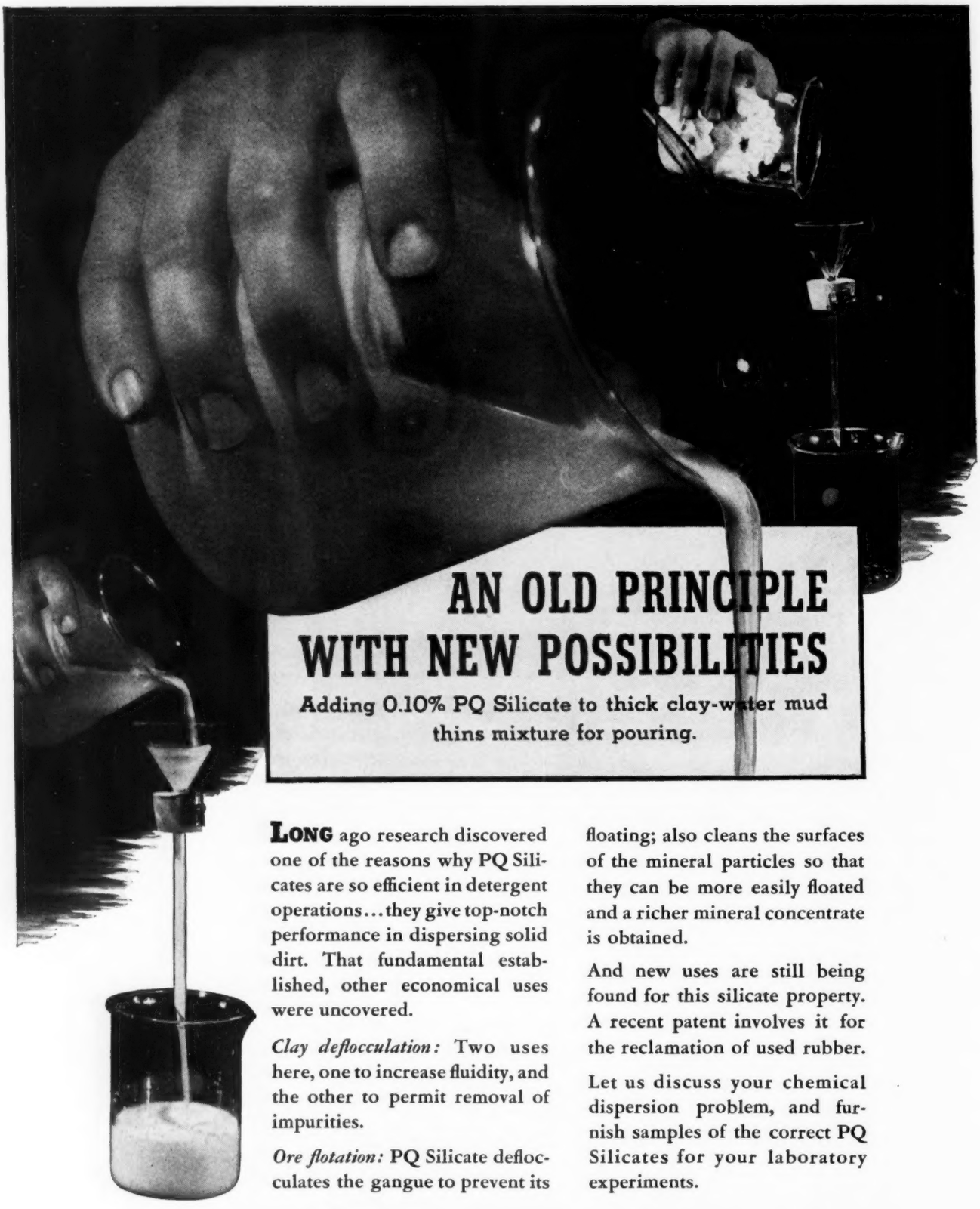

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CHECK THAT CASTING... FAST!

How du Pont Research Speeds War Production

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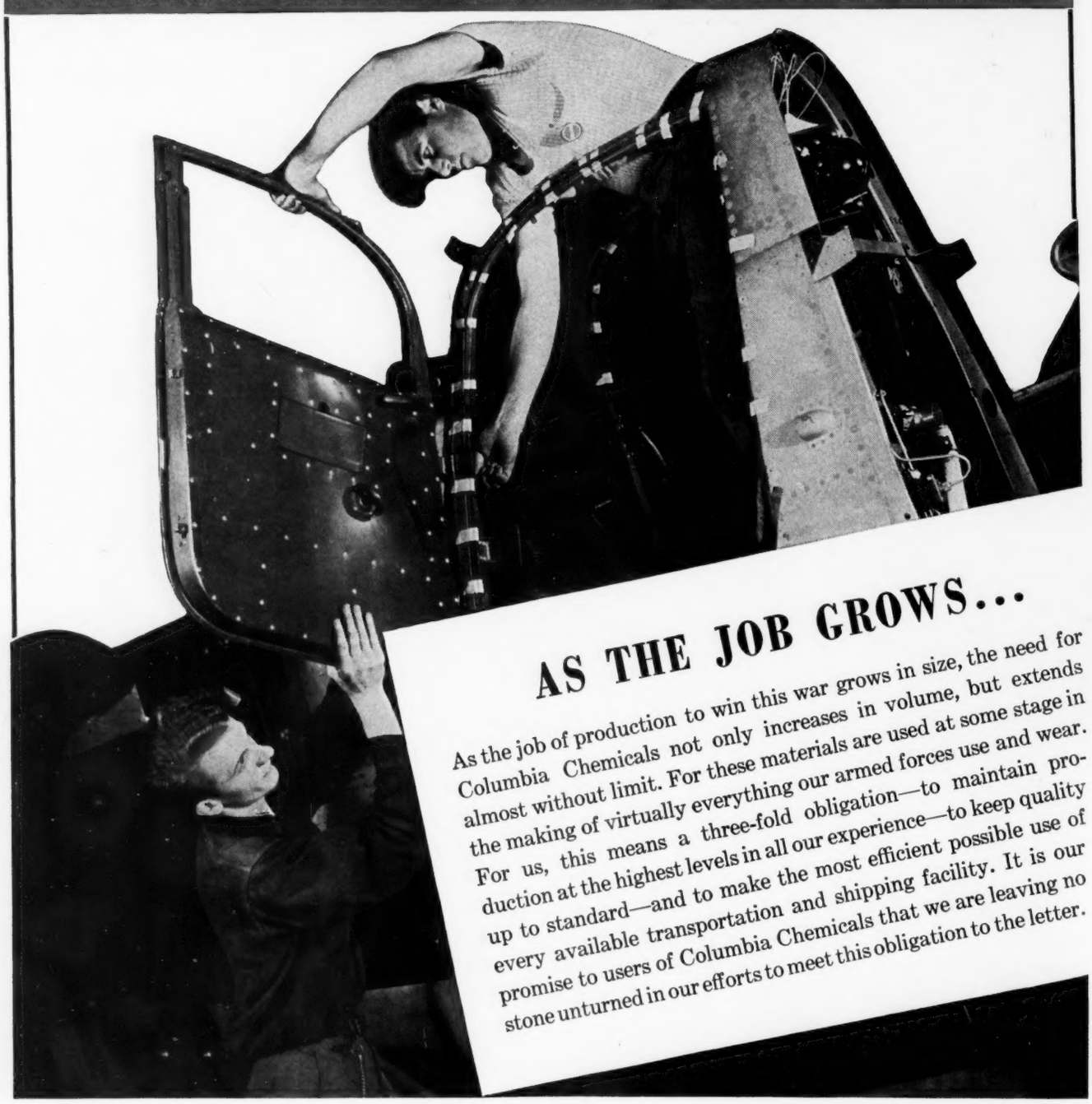

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As the job of production to win this war grows in size, the need for Columbia Chemicals not only increases in volume, but extends almost without limit. For these materials are used at some stage in the making of virtually everything our armed forces use and wear. For us, this means a three-fold obligation—to maintain production at the highest levels in all our experience—to keep quality up to standard—and to make the most efficient possible use of every available transportation and shipping facility. It is our promise to users of Columbia Chemicals that we are leaving no stone unturned in our efforts to meet this obligation to the letter.

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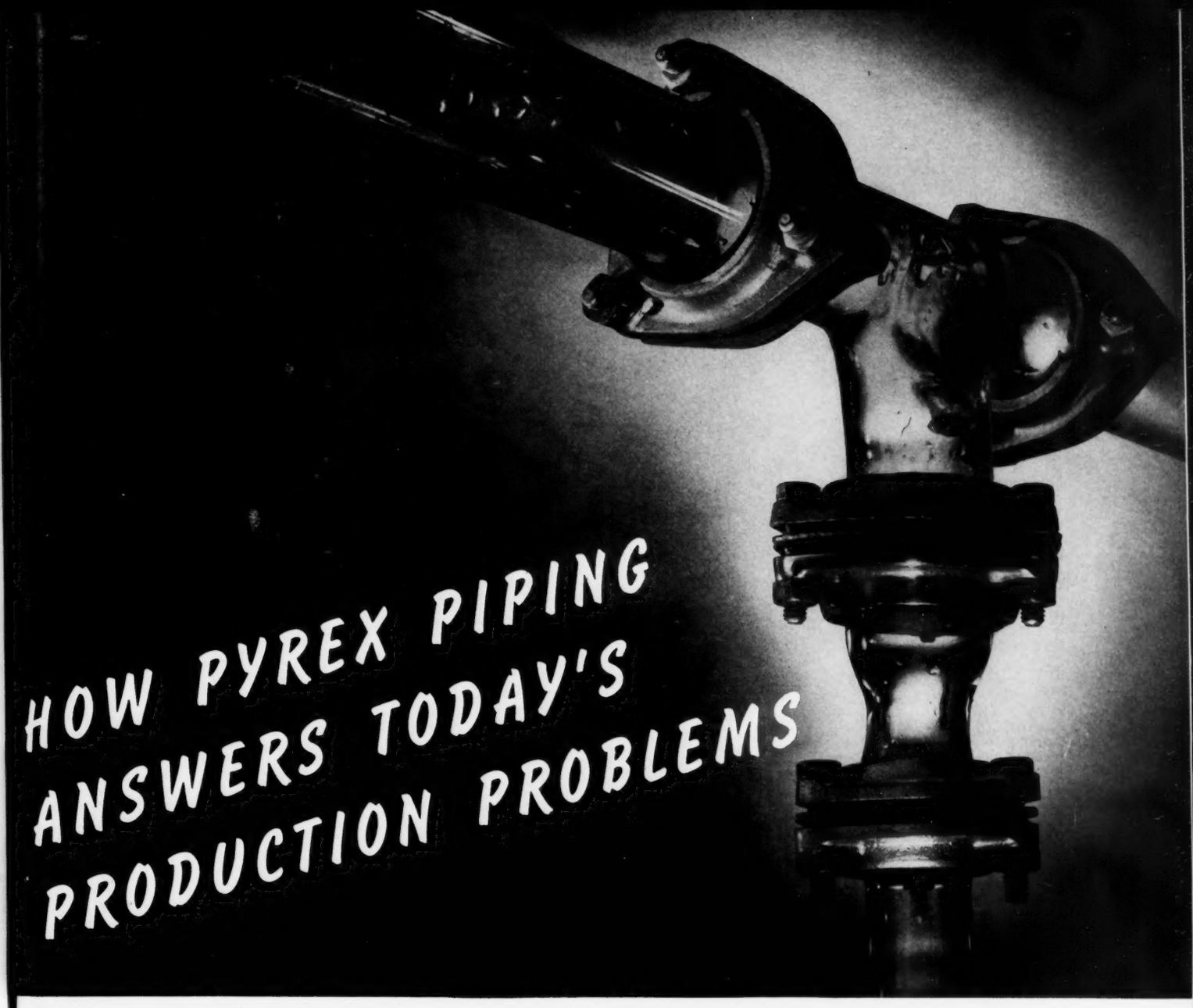

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Performance records prove that PYREX Piping decreases shutdowns for replacements.

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The initial cost of PYREX Piping is often substantially less than other corrosion-resistant materials. And the service life is incredibly long.

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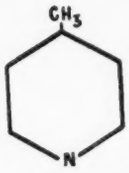

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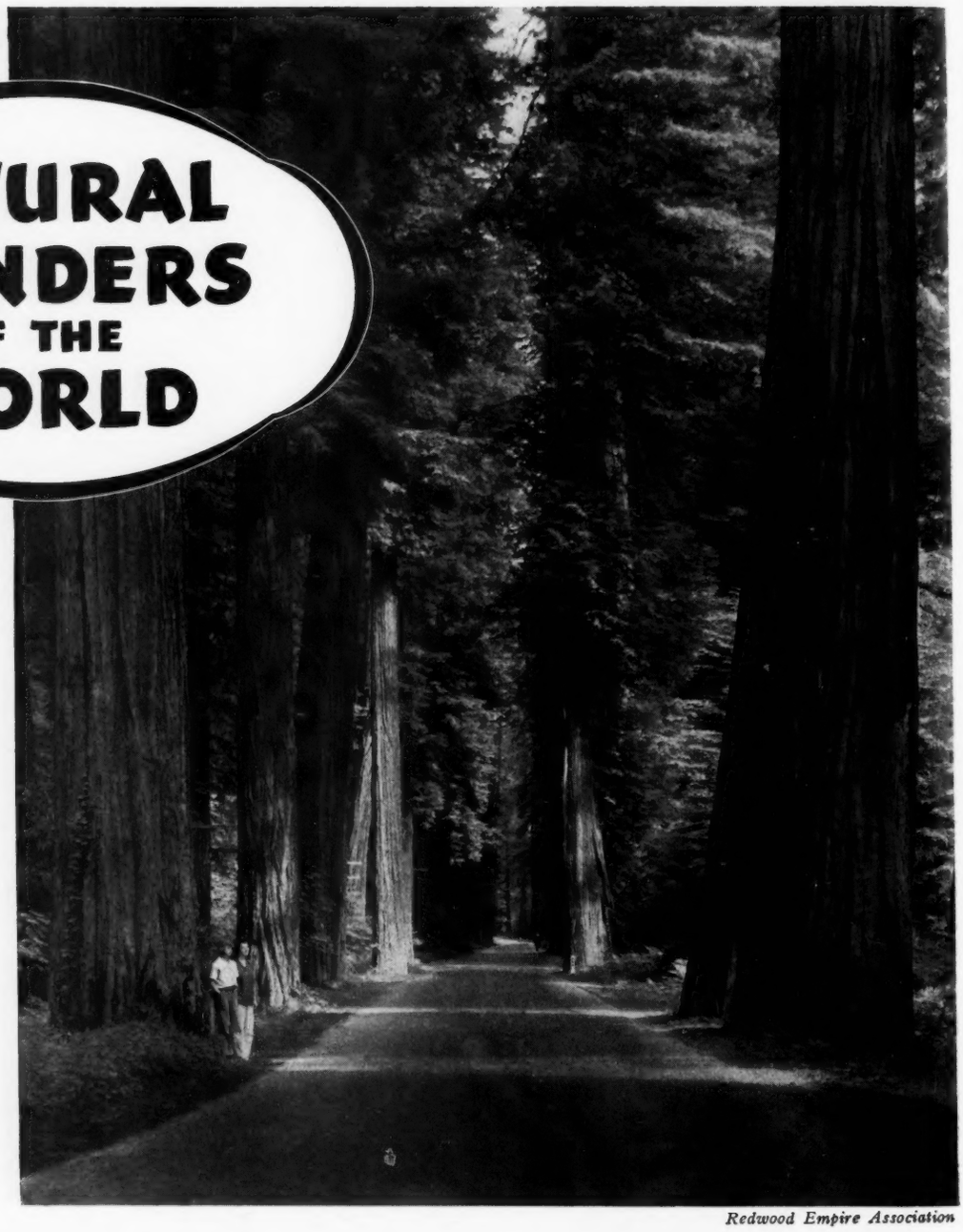

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Van Nuys' Bill—A Step In The Right Direction

EDITORIAL

High army and navy officials and Donald Nelson, WPB chief, are lending their active support to a measure sponsored by Senator Van Nuys which would "suspend the operation of the anti-trust laws of the Federal Trade Commission Act in certain instances requisite to the prosecution of the war." This is a constructive step and one that should be given the "green light" in Congress, for it will permit large numbers of producers of vital war materiél to devote their entire attention to production. Only those who are directly connected with the problems of production and procurement can appreciate fully how the fear of possible prosecution has hamstrung output at a time when every effort is necessary to meet a challenge by foes who have had five to ten years of all-out preparation for industrialized warfare.

As amended late last month, the proposed bill would center full and final authority with Nelson to suspend the anti-trust laws in cases where the head of the WPB believes such action is necessary to the war effort. This is a much more logical set-up than originally proposed where Mr. Nelson would simply have had the authority to recommend exceptions to the Attorney General. The War Production Board should possess every right to make final decisions on all matters pertaining to production. Otherwise chaos will be the inevitable result of divided authority and responsibility, and industry will continue to be bewildered by a multiplicity of agencies, each attempting to enforce laws that admittedly work adversely when a democracy faces the attack of totalitarian nations.

The proposed measure appears also to have the blessing of Thurman Arnold who has taken the position that, if strict enforcement of the anti-trust laws is undesirable in a war period, Congress then should prescribe a suitable remedy rather than to leave to the discretion of the Department of Justice the question of determining when, where and how suspension of the law is to be permitted.

The joint letter, urging prompt favorable action on the Van Nuys' Measure, signed by Acting Secretary of War, Robert P. Patterson, Acting Secretary of the Navy, James V. Forrestal, and WPB Chairman Donald Nelson, states in part:—

"It would seem that the clear statement of national policy of the proposed statute (the amended Van Nuys bill) would set at rest all reasonable doubts and make possible an immediate acceleration of cooperative activity in the fields where the chairman of WPB believes such activity to be necessary.

"The WPB and its chairman are officials who must necessarily determine what measures are requisite and appropriate to meet war and civilian requirements. Time is of the essence and the determination can be made wisely and with due expedition only by that administrative agency which knows all the needs and is so close to the entire situation as to know what are the best measures for meeting this demand.

"The chairman of this board alone is in a position to act promptly and finally on these matters from day to day as the situation changes and emergencies arise.

"The proposed bill is not a blanket suspension of the anti-trust laws, nor does it envisage their repeal. It would apply solely to measures in the interest of war production, the chairman of WPB to have the right to withdraw his direction at any time the necessity therefor ceases."

A still further constructive step would be to halt for the duration the many suits charging violations of the Sherman Anti-Trust Laws now in the courts and dealing largely, if not wholly, with alleged acts that are said to have been consummated as much as five and ten years ago. Also it would materially assist the war program if the attacks on industry *via* Washington propaganda were stopped. Let the War Production Board decide what companies, if any, are not patriotically cooperating wholeheartedly. It is fully capable of dealing with any such situations when and if they arise.

Hold Out the Chemical Technologists: So much has been said and written on the subject of drafting chemists and chemical engineers that it may sound like needless repetition to return to the question again and again. Yet all signs indicate that we are still wasting the very limited technical brains of the country in a manner that will seriously threaten the war program.

The fault very definitely does not lie with the Selective Service Headquarters in Washington and the leadership of General L. B. Hershey. General Hershey and his colleagues in Washington understand thoroughly what kind of a war we are waging. They have repeatedly emphasized the importance of holding in technical occupations chemists and chemical engineers, and even the instructors in these fields. Nor can General Hershey rewrite the Selective Service Act.

There is very little if anything wrong with the Act itself. It is from its interpretation by some local draft boards that trouble arises. Then, too, many employers are at fault and, likewise, there are many misguided technologists who for one reason or another are joining the colors when they should remain at their control, research or production posts.

Anyone who has studied the present war can recognize that all of its successful operations have been carried on by relatively small bands of men provided with entirely disproportionately large amounts of war materiél. It is difficult to get accurate figures as to just how many individuals are necessary in the army of production to supply the requirements of the armed forces, but the proportion is somewhere between one to ten and one to seventeen. And this does not take into consideration the fact that America is the arsenal of our allies.

Local draft boards, employers of technologists, chemists and chemical engineers should constantly keep in mind two figures:—

TWENTY-SEVEN MILLIONS —
ONE-QUARTER MILLION.

The twenty-seven millions refer to the men in the Selective Service System up to the age of thirty-five years. The one-quarter million refers to all of the scientific and technical men in the National Roster from the graduating class of 1942 to men eighty years of age. The National Roster includes the chemists, chemical engineers, physicists, bacteriologists, geologists, and the like in all fields of science. If we lose this war, it will not be because of the twenty-seven millions but either because the quarter-million is too small, or because we do not utilize the services of the quarter-million effectively. Of the one-quarter million about 60,000 are chemists and chemical engineers. This number was necessary to our peacetime production activities. What then will be the picture six or twelve months hence when we place on top of an already astronomical production program the technical man-power requirements of a million-ton synthetic rubber program—just to mention but one additional production activity born of necessity in the last few months? Truly we face a desperate shortage of trained personnel in 1943 and 1944 when about two billion dollars worth of new chemical plants will be completed.

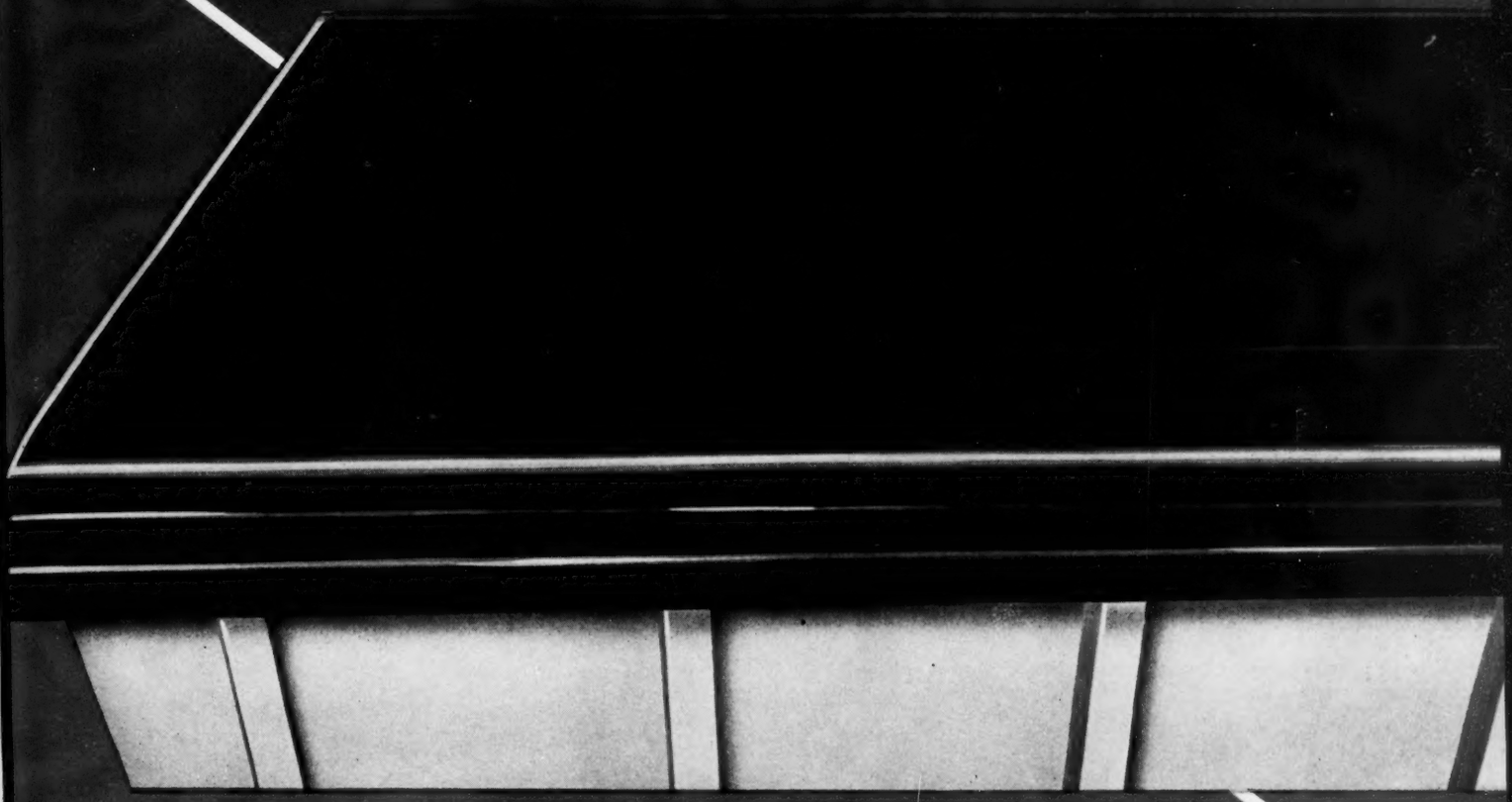
It is perfectly astonishing how little many employers of chemists and chemical engineers know of the mechanics of draft procedure. A few days ago one employer called the editorial offices of CHEMICAL INDUSTRIES to inquire about the procedure for asking deferment for one chemist, and then blandly announced that he was not asking for deferment for still another graduate chemist for the reason that he did not consider that this particular man was working on materials closely allied to the war effort. A little questioning brought to light that the second man was indeed working on a problem of utmost importance to the physical well-being of not only the armed forces but the civilian population as well. Some employers labor under the delusion that this war is being fought with explosives and nothing else. Still others feel that they are open to criticism if they seek deferment for all chemists. Under existing conditions we cannot afford to permit one single technical man worthy of the name to move into the armed forces when he is either sorely needed in his present position or can be assigned in the near future to a position where his special talents can be used intelligently. Once a chemist or chemical engineer is drafted into the army and is driving a truck or shooting at a Nazi or Jap, he is lost to the production army. The red tape involved in retrieving him from such a position is pretty hopeless. Germany with considerably less total population actually is equipped with greater numbers of technically trained men. Let us not dissipate the small inheritance we have. These men are irreplaceable and upon the intelligent utilization of their abilities may well depend the outcome of this war.

Get the Scrap into the Scrap: Donald M. Nelson, Chief of the War Production Board, is one not given to over-statements. For this reason, his pointed warning to the American public that waste is treason, given before the National Association of Purchasing Agents last month, is of special significance.

The part that industry must play was succinctly expressed by Mr. Nelson when he stated:—"The pressing need for the fullest cooperation of industry in this effort will be made apparent when I remind you that the men who know the scrap situation state that seventy-five percent of the critical scrap materials we need will have to come from industrial establishments, whereas only twenty-five percent of our requirements can be expected to be assembled from households, retail stores, automobile graveyards and other salvage projects of special nature . . . Scrap is now a secondary raw material and it is the patriotic duty of every citizen to report hoards of critical material."

Management has a clear responsibility. Do not deal haphazardly with the problem. Set up the necessary machinery and personnel to do a thoroughly efficient job. Next to increasing still further production for the all-out war effort, the matter of bringing to the surface all unused critical materials is of paramount importance. Indeed the success of the former is largely dependent upon how well the latter is done by industry. The chemical plants of this country must do their part in this drive and what they can contribute is very important.

TYGON *geared to the impossible*



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For Tygon, unlike rubber, does not chemically deteriorate with age. It is not affected by air, sunlight, or oxidizing chemicals. Tygon, unlike rubber, does not swell in oil or water and is unaffected by many solvents. Within the range of its temperature limitations (–15 deg. F to 175 deg. F) Tygon possesses greater resistance to abrasion than rubber.* Unlike rubber, Tygon will burn only when in continuous contact with flame.

Tygon, like rubber, possesses high dielectric strength — of great importance in plating operations where current sometimes plays queer tricks on linings...and unlike rubber, Tygon will handle any plating solution.

Not alone as a replacement for rubber — the use of Tygon is indicated for those installations where the physical qualities of rubber are desirable but where its use is prevented because of its admitted weakness to the attack of certain corrosives. For example, even the best rubber compounds will not handle nitric acid, high concentrations of sulphuric acid or chromic acid. Tygon will handle all three — and, likewise, Tygon is unaffected by any of the reagents which rubber will handle satisfactorily. Tygon, however, is attacked by chlorinated solvents, fuming nitric, glacial acetic acid and certain of the ketones.

** Tygon can be compounded to fit specialized needs with varying physical characteristics as desired. For technical data write Synthetics Division, The United States Stoneware Company, Akron, Ohio*

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New aspects of research and law

THE NEW FOOD, DRUG and COSMETIC ACT

H. A. Toulmin, Jr., *Toulmin & Toulmin, Dayton, Ohio*

The new laws affecting the sale of food, drugs, cosmetics and chemicals make chemistry, chemical engineering and research predominant in compliance and enforcement. There are aspects covered in this treatise which you will do well to commit to memory.

RECENTLY a Federal Court fined a seller of a medicinal preparation $3,250.00 and costs for thirteen violations of a Federal Trade Commission cease and desist order because of false representations that his product was a gland tonic. This fine of $250.00 for each violation was mild. Under the law it could have been as high as $5,000.00 for each violation.

In 1938 manufacturers received a new law from Congress that is the beginning of a complete revolution in the relationship of manufacturers to their Government. The 1938 Food, Drug and Cosmetic Act and the Wheeler-Lea Act on advertising put obligations and responsibilities upon manufacturers of a wholly new type. The Food Act is administered by the Food and Drug Administration and the Wheeler-Lea Act is enforced by the Federal Trade Commission. These new laws must be read in connection with the Tea Act, the Import Milk Act, the Filled Milk Act and the Caustic Poison Act.

The first impact of these new laws is to make chemistry, chemical engineering and research in those fields predominant in the compliance and enforcement of these Acts. This is due to the fact that under these laws the manufacturer must be able to justify not only his label statements, labeling his products, but his advertising and selling efforts. More important still, the burden is on him to prove their correctness as contrasted with the old laws where the burden was on the Government to prove their falsity.

The research laboratory in plant, university and under independent control now becomes an absolute essential in the program of any manufacturer. The penalties for false labeling and for false advertising are both civil and criminal. There must not only be truthful labeling but there must be freedom from adulteration and contamination. The products can be seized and destroyed and both financial penalties and criminal action can be taken against the offending manufacturers.

It is a long road from the days of Dr. Wiley and his one man campaign to secure the early Food and Drug Act and the present Food and Drug Administration under the able direction of Colonel Paul V. McNutt. With nearly a thousand personnel of chemists, bacteriologists, physicians, veterinarians, microscopists, pharmacologists, inspectors and administrative offices divided into three field districts, the Administration is now equipped to put teeth into this law.

The field force numbers more than six hundred persons organized into three inspection districts. This personnel can be shifted repeatedly to meet emergencies through contamination and spoilage of large quantities of products by flood waters or the discovery of a dangerous drug or poisonous food as in the case of the Elixir Sulfanilamide which took the lives of more than one hundred people. That sort of a thing will be unlikely to happen under the new law. Such a disaster was due to a complete lack of chemical or pathological control and an utter disregard of even the elementary precautions which any competent chemist or pharmacist would have taken.

Some idea of the extent of control and the burden of enforcement can be gained from the fact that the products controlled have a value of more than $11,000,000,000 per year exclusive of non-process foods and imports. The Administration supervises 3,000 creameries, 2,200 cheese plants and the large dried milk industry. All this is outside of the control of the vast pharmaceutical industry. To do this it is necessary to select typical industries or types of products for attention supplemented by informal methods of enforcement and formal methods of seizure of the goods, criminal prosecution, fines and injunction.

In the broadening scope of the Food, Drug and Cosmetic Act of 1938 which now includes devices affecting the public health and cosmetics and certain types of medicinal soaps, the labeling requirements are positive. There must be no omission of any material fact as well as no misstatement. The terms must not be misleading and the label has to be adapted to the type of the merchandising and handling of the product. For instance, there is one group of regulations applying to products to be sold only to and through physicians, while a wholly different set of requirements are established when the medicine is to be bought directly by the public through a druggist. In order to make these truthful statements and to make them complete it is necessary to have both laboratory and clinical tests to support them not only to be sure of their truth, but to show good faith and absence of intent to make a false statement or to defraud the public.

Then too this Act establishes food standards. This is one of the most far reaching of the provisions in a constructive sense in that manufacturers are given definite food standards with which their product must comply. Here again the chemist, bacteriologist and microscopist become important people in the handling and distribution of foods.

Preventing Adulteration

A good example of preventing the adulteration of foods is in the case of bread. Bread, for example, may be made with widely varying moisture limits and, because of this, it is necessary to determine at what point water is being sold for bread. Likewise preserves must not be so manufactured that the fruit ingredient is but a very minor percentage of the finished product. The Administration is particularly diligent against food manufacturers who alter the composition without altering the appearance of the final products or who vary the quality without disclosing the fact on the label. The regulations for foods establish a reasonable definition and a standard of identity, quality and fill of the container. Butter, because it has been defined by law as requiring not less than 80% milk fat content, is excepted. Fresh or dried fruit and vegetables also are excepted, but standards of identity relating to maturity and effects of freezing may be established for certain fruits.

The unique feature of this law is that the Government undertakes to protect the public by protecting it against the unfair competition of one manufacturer against another. Previous laws of this type were mainly devoted to giving a privilege to one manufacturer to prevent unfair competition against himself from a competitor: now the Government assumes that

H. A. Toulmin, Jr.

responsibility in order to protect the public interest.

Thus a new day in the joint partnership of science and the law opens up endless possibilities for a new type of public law administration.

The labeling of foods, drugs, devices and cosmetics includes not only the label and the package in which the product is shipped or delivered but also all the written and printed matter accompanying it. The statements must be in terms the ordinary consumer is likely to read and understand under customary conditions of purchase and use. In determining whether a fair statement has been made the Administration not only considers the representations made but any failure to reveal facts which would mislead or cause disastrous consequences in the use of the drugs. The control even goes to the point that even if the labeling is adequate the containers must not be of such shape or filling as to mislead the consumer.

If a food does not meet a legally established definition or standard of quality or that for a filled container the discrepancy must be clearly stated on the label. In case of standards of identity no deviations are permitted. Where the foods are unstandardized, the label must reveal a full statement of ingredients, for instance, artificial flavoring, artificial coloring, chemical preservatives and the article must be labeled as such. When a food is sold as having a special dietary use, the information must disclose statements as to the vitamin, mineral and other dietary properties.

In the labeling of drugs and devices they must not only bear adequate directions but also warnings specifying the use, dosage and administration. Habit-forming drugs and their derivatives must bear the statement "WARNING: may be habit-forming." When drugs are designated by any other than that in the compendia list the information as to their ingredients must be much more complete than in the case of official drugs. Particular care has to be taken in the packaging and labeling of drugs liable to deterioration.

While misbranding is concerned with labeling representations, adulteration is concerned with the content of foods, drugs and cosmetics. For if a product of this sort is adulterated when it consists in whole or in part of any filthy, putrid or decomposed substances. Even the preparation, packaging or storage under unsanitary conditions as in the case of sea foods might so contaminate it so as to form adulteration. Likewise containers must not be composed of poisonous or deleterious substances. If a product should bear or contain a non-certified coal tar color it could be condemned as being adulterated. No part of any food may be a product of a deceased animal or one other than has died by deliberate slaughter.

Deceptions which are illegal are those which increase bulk or weight, reduce quality or strength, disguise the absence of valuable constituents, or make a food appear different than it is. For instance, confectionery has been singled out for special attention to eliminate alcohol.

Among the interesting and constructive administrative controls of the Administration are the steps taken by it to establish standards for foods, emergency permit controls over any class of food which may be contaminated with microorganisms, the requirement that new drugs be controlled to insure their safety by means of applications filed by the producer in advance of their statement in interstate commerce. Coal tar colors must be listed to insure their harmlessness and suitability for use; and batches of such colors must be certified to insure freedom from impurities.

No person may introduce in interstate commerce any new drug until it has been checked by the Administration. The manufacturer or seller of the drug must first make application for the privilege of selling and submit prescribed information so that an accurate decision may be made as to the safety of the drug by the Federal Security Administrator. This precludes the sale to consumers of drugs not generally recognized among qualified experts as safe for use under the conditions recommended on the label.

Such new drugs must be first subjected to appropriate experimental tests proving that they are safe before they can be shipped in interstate commerce for public use. The good sense of the Act is the provision for limited distribution for new drugs when intended solely for investigation by experts as in the case of the new sulfur drugs tentatively submitted for experimental use by physicians.

More than 125 new drugs have been submitted per month during the first three years of the Act and fully a third of those submitted are refused permission to be sold in interstate commerce. But the Administration's responsibility does not end when an application has been granted. It continues its observation to insure proper manufacturing control and uses. This enables an early discovery of any harmful results in actual medical practice which may require reconsideration of the decision to permit traffic in the drug. The new law gives authority for immediate revocation of any permission.

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* Editor's Note: Colonel H. A. Toulmin, Jr. of Toulmin & Toulmin, Dayton, Ohio and Washington, D. C., is the author of the new book entitled "A Treatise on the Law of the Food, Drugs and Cosmetics", 1800 pages, published by The W. H. Anderson Company, introduction by Colonel Paul V. McNutt, Administrator of the Food and Drug Administration.

Lime as a Chemical Raw Material

IN TWO PARTS: PART TWO*

By Wallace E. Wing, *Marblehead Lime Company*

Lime—abundant and inexpensive—is one of the most important basic raw materials that chemists and chemical engineers have at their command. The conclusion reviews the wide variety of the innumerable uses that there are for lime in modern industrial life.

IN Part 1 of this discussion on "Lime As a Chemical Raw Material" the history of lime, the trends in consumption, and the several methods of production were discussed. Possibly, however, the most instructive angle of discussion is a review of the wide variety of uses there are for lime—one of the most important basic raw materials that the chemist and chemical engineer have at their command. It is abundant and inexpensive.

Electric Furnace

Lime is used in the electric furnace in much the same way it is used in the open hearth except that the lime is small in size, a considerable amount of pulverized quicklime is used in this operation to aid the solution of the lime in the slag. Many of the same chemical reactions take place in the refining of steel in the electric furnace as in the open hearth. Clinkered dolomite is also used as a refractory material in this operation. The relative tonnage of steel produced is small compared to the open hearth but the tonnage is very important. Practically all of the stainless steel is made in the electric furnace as well as the high grade tool steels.

Blast Furnace

Lime can be and has been used as a charge in the blast furnace to speed up production and lower the fuel ratio. Lime can be calcined more effectively and at a lower cost with less expensive fuels outside of the blast furnace. The general practice, however, is to use limestone as part of the charge. Low sulfur, silica and phosphorus are prime requirements for this lime application.

Lime is also used for pig mould coating in the operation of *pigging* the iron after it is tapped from the furnace. The pig mould machine is a continuous conveyor of cast iron moulds into which the molten iron is poured to cast the pigs. The iron will adhere to the iron moulds unless some coating is provided. Dolomitic lime is generally used for this purpose and it must be slaked to a very fine state of division so as to produce a complete coating that adheres well to the moulds. Lime is a very satisfactory material for this use and introduces no undesirable impurities if of proper grade and further imparts a good color and leaves a smooth surface which is desirable for merchant iron.

Lime is used in the drawing operation of steel for drawn bars and wire. It is used to neutralize the acid pickle bath, to provide a smooth coating and desirable color to the finished steel as well as to lubricate the die in the drawing or reduction of the steel. Each of the above qualities are necessary to a satisfactory lime for this purpose and the lime must slake to a smooth, finely divided hydroxide which has good adhering qualities. The fine state of division is usually a function of the slaking operation and the ability of the lime to adhere is a function comparable to some of the irreversible colloids in the paint industry. A further property of the lime and one which is tied up with the particle size is the ability to stay in suspension.

Electric Furnace—Calcium Carbide

The production of calcium carbide requires much high calcium lime of very low magnesium content. This is a high temperature operation and is produced in the electric furnace by fusing carbon and lime in about equal proportions. The reaction begins at about 1500° C. and the carbide fuses at about 1800° C. At this later temperature the furnaces are tapped and the carbide is run off in the molten state. Phosphorus, arsenic and sulfur are impurities that must be kept at a low

* Part 1 appeared in the May issue, pages 612-617.

Firing floor and punching door of shaft lime kiln.

Firing end of a rotary kiln.

minimum. The phosphates are reduced to phosphide which yields phosphine with water and the generation of acetylene with water is thus liable to spontaneous combustion. Arsine and hydrogen sulfide are toxic and so must be avoided. Magnesia reduces the fusibility of the carbides and so increases the electrical energy input and make the furnace difficult to tap. Carbide is used in the production of acetylene and thus has many uses as a raw material for many syntheses. Carbide is used as a raw material for the production of cyanamide and calcium silicon. Calcium silicon is finding very extensive use now in the electric furnace production of steel and in the founding of grey iron coatings. This development is very much in its infancy.

Electric Furnace—Steel

Clinkered dolomite is used for refractories in the electric furnace for the production of special steels and the application there is to care for repairs due to slag damage after a heat. Lime in the oxide form is used for fluxing impurities and conditioning the slag. The rate of solution of the lime in the slag is important; sulfur and phosphorus must be kept at a minimum because those impurities are removed in the refining of steel.

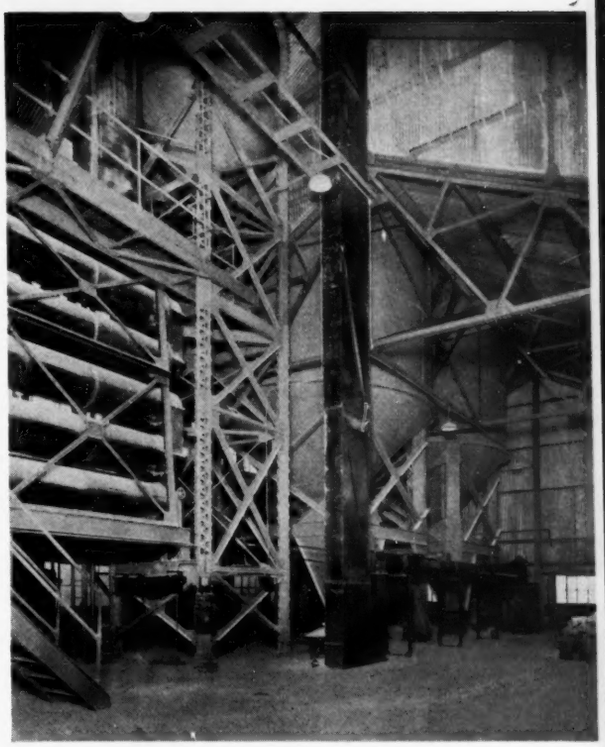
Lime as a Causticizing Agent

Paper Manufacture

The value of lime as a causticizing agent is best demonstrated in the sulfate kraft paper industry. Lime does not enter into the actual paper making process instead it is used to causticize the recovered soda ash in order to make "green liquor" (caustic soda) used for cooking the wood chips to remove ligneous matter and free the cellulose or wood pulp. The wood chips are cooked under pressure in the caustic "green liquor" and this removes the ligneous material which holds the fibre together. After cooking the fibre is removed from the cookers and washed free of the caustic soda. This "black liquor" is evaporated to remove part of the water and then burned in kilns to remove the resins and ligneous material and convert the sodium compounds to the carbonate form. This sodium carbonate is made up to form the "green liquor" so called because of its color which is imparted by the chrome in the chrome brick lined furnaces in which the black liquor is calcined. The green liquor is treated with a milk of lime that reacts to form caustic soda and calcium carbonate. The calcium carbonate is allowed to settle and then separated from the caustic. In some cases the calcium carbonate so formed is reburned to return to the process and in other cases it is used as such for sizing and coating for the paper.

Sulfite pulp is obtained by digesting wood chips with an acid liquor at high temperature and pressure. The acid liquor is a bisulfite of lime liquor and is composed of calcium and magnesium bisulfites in solution together with sulfur dioxide (SO_2). This is sometimes prepared in towers filled with limestone by circulating water which is subsequently converted to the liquor over the stone and passing sulfur dioxide gas countercurrent up through the limestone. Sometimes the acid liquor is made by passing sulfur dioxide gas through a milk of lime suspension.

Lime is used in the manufacture of calcium hypochlorite or liquid chlorine bleach for the bleaching of the paper pulp. The bleach is made by passing chlorine gas through a milk of lime suspension under carefully controlled conditions. The lime for this use must be low in manganese and iron in order to not form suspended precipitates which cloud the end



Mechanical hydrator for producing hydrated lime.

point in determining the completion of reaction in the manufacture of the liquid chlorine bleach. This bleach is sometimes made in towers similar to the Jensen towers of the sulfite pulp mills, where the towers are filled with glass or vitrified brick to give surface to the lime solution for the reaction of the chlorine gas. Some operators chlorinate the milk of lime suspension in a vat with an agitator in it to provide adequate mixing and in this way prevent over-chlorination which causes the formation of chlorates and chlorides. The chlorides and chlorates combine the chlorine in compounds that are unavailable for bleaching.

Lime is used in the manufacture of strawboard. Lime and sodium carbonate compose the charge which is added to the digesters to produce a caustic liquor for separating the cellulose fibre. Wheat straw is usually used for strawboard. Pulverized high calcium lime is used to a large extent and insoluble impurities are particularly objectionable because they produce small defect holes in the sheet which is troublesome in corrugation besides weakening the sheet. Either quicklime or hydrated lime may be used for this process.

Saponifying Agent

Soaps are alkali salts of organic acids made from hydroxides produced by causticizing with an alkaline earth base such as lime. The causticizing action of lime is made use of in the soap industry to produce caustic soda and also to make lime soaps. Lime is also used to

Hand loading quarry showing tilted bedding of limestone.

make lime soaps for the lubricating field. The calcium soaps are diluted down to make the various greases. The caustic soda made from lime as a causticizing agent is used in mercerizing cloth in the textile field.

Lime is used to saponify organic salts and in making organic hydroxides in the dye and organic chemical industry. Lime is used in the treatment of fats and waxes where glycerine may be split off together with the formation of the alkaline earth salts of the fatty acids. As mentioned previously lime is used to saponify oils and in the manufacture of lubricating greases.

In the varnish industry it is necessary to modify the resinous acids found in rosin and lime is used for this purpose. The pH value of the rosin melt must be changed and this modification is made with the addition of hydrated lime usually. The addition of lime changes the viscosity of the melt before the addition of other oils. A high calcium lime is used which is low in silica, iron, alumina, and magnesia.

Dehydrating Agent

Lime as CaO will combine with the occluded water and the water of constitution of certain chemical substances and render them anhydrous. In this manner lime finds use in the manufacture of alcohol, both ethyl and methyl and in certain petroleum products for dehydration. A long list of solvents offers the same opportunity for the use of lime in dehydrating them.

Hydrolysis

Glue Manufacture

Lime is used as a hydrolyzing agent and in the treatment of glue stock in the cooking or boiling process. It is perhaps more of a plumping action but it is a most important part in the process. The reactions are rather complex and are both chemical and physical. The collagen hydrolyzes further into semiglution and hemicollin. The whole process seems to be a breaking down of colloid complexes with the accompanying changes in the amount of absorbed water. The stock is plumped with lime and at times the thick, dry hide pieces take several months to lime, whereas, the thick skivings from hides limed at the tannery are frequently ready to boil. The plumping action which is so important loosens the hair so that a slight rubbing removes it and the pieces of hide swell to several times their original size and are firm and rigid in appearance. The plumping action is best brought about by a solution of definite alkalinity. The alkalinity of a saturated lime solution is very close to that required to give the best results from the standpoint of the swelling action. A further advantage in lime is that you can use a supension and as the dissolved lime is used up, more lime at once goes into solution to replace that used and so the solution is maintained at the proper alkalinity automatically. Weaker alkalies are not sufficient to remove the impurities because they will not dissolve them while stronger alkalies will dissolve too much collagen. Lime has a germicidal action that is very beneficial when the period of plumping action is long as is true in the case of thick dry hides which sometimes require as much as six months. The action of the putrefactive organisms is almost entirely eliminated when lime is used and this eliminates the necessity for using other preservatives during the liming process. The proper lime for this use should be a high calcium lime, either quicklime or hydrated and upon slaking or soaking should remain in suspension a long time. This, of course, is a function of particle size.

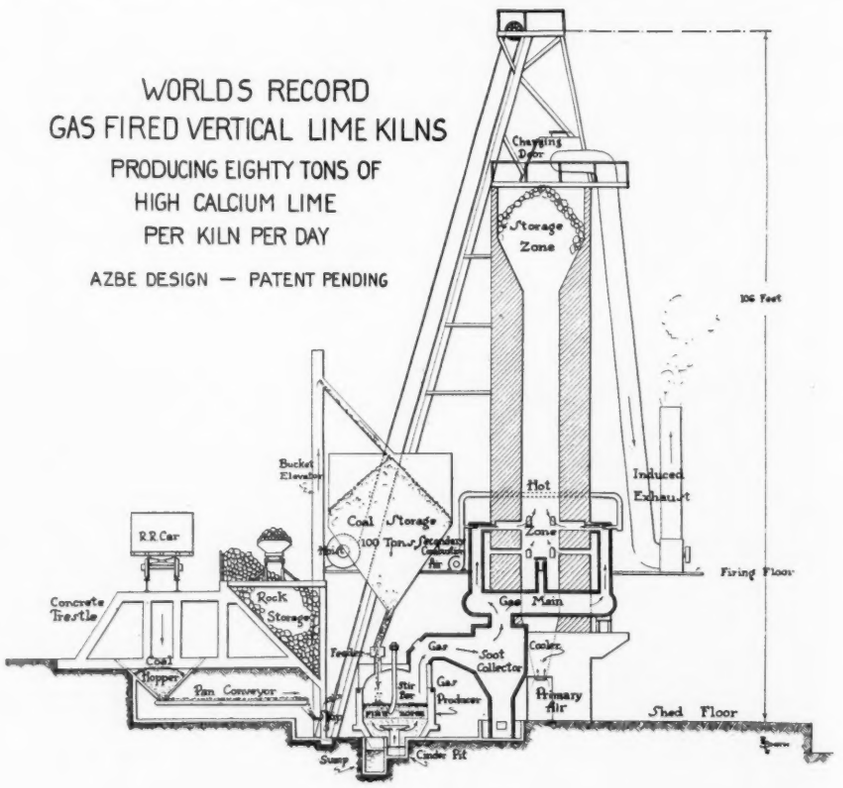
Tanning

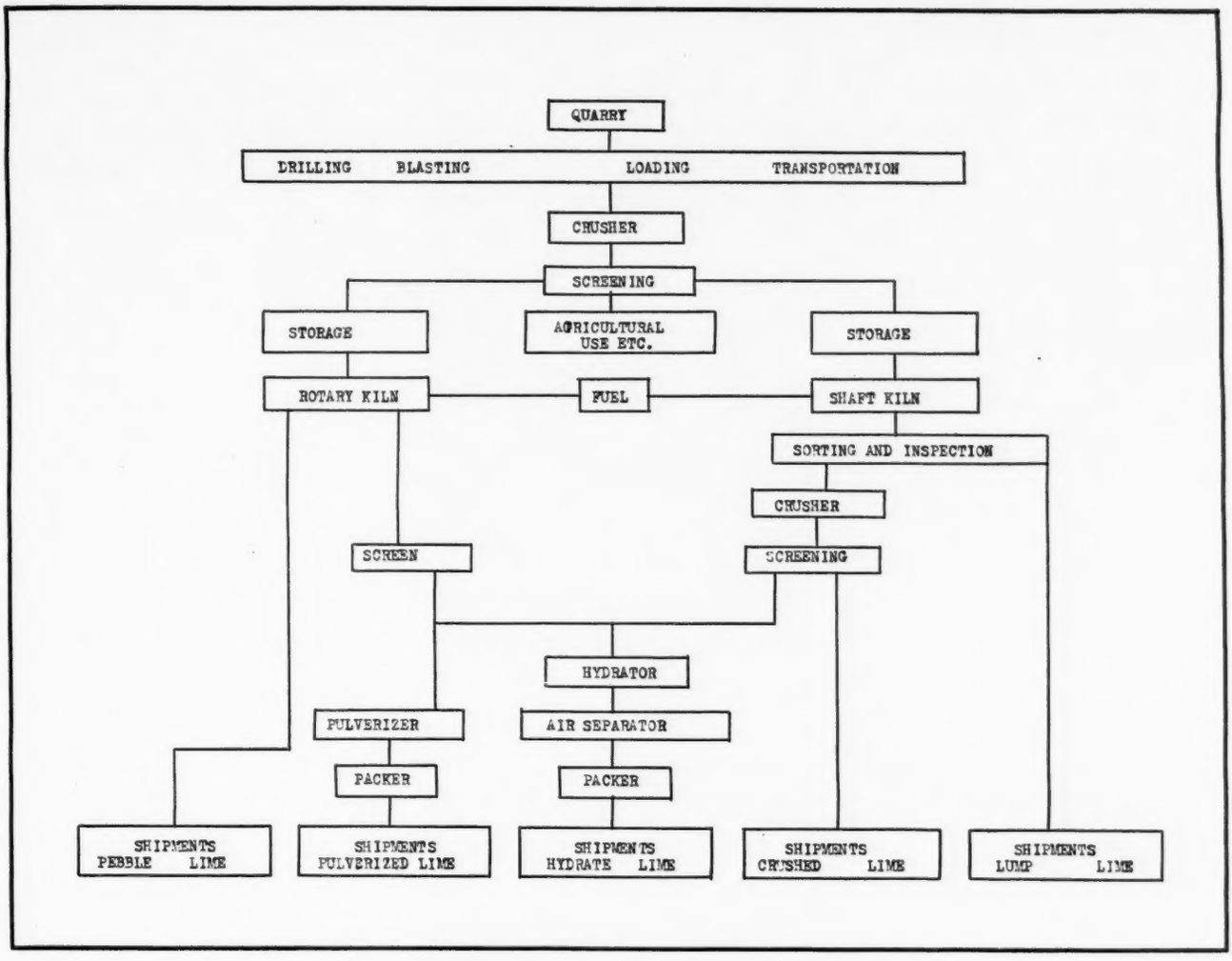
In the tanning industry lime is used to plump the hide preparatory to the dehairing process which in effect causes a series of very complex reactions that involves bacterial or putrefaction of certain of the epidermal cells and hair sheaths. The swelling action or plumping of the hides opens the cell structure so as to facilitate the access of the tanning liquors to the skin fibre. The one big advantage of lime in the tanning of leather is the limited solubility of the lime and because of this it is impossible to overlime the hides and so damage them. The swelling action is a chemical and physical phenomenon and the reactions are almost identical to those of the glue manufacture up to a certain point. The collagen hydrolyzes and the osmotic pressure set up within the hide causes swelling. Stale lime liquors often soften and de-hair the hides more rapidly due to the bacterial action but fresh lime suspensions give better plumping action and prevent injury to the hide due to too much bacterial action or putrefaction. For this reason the tanneries have a series of lime vats and the hides are allowed to soak for a period of time in each vat finishing off in the fresh lime vat.

Coagulation

Sugar Industry

Lime is used as a coagulant in many industries such as the sugar industry, treatment of ore slimes, water treatment and sewage. Lime is used in the beet sugar industry in their process known as defaction. In this process the beets are sliced and the sugar is extracted by the action of hot water in iron vessels which are the diffusion battery and the juice so extracted by this hot water process is then heated and a milk of lime added. The lime suspension is soon carbonated with CO_2 gas and the precipitated calcium carbonate is filtered off. The function of the lime in this process involves somewhat more than just coagulation but it is a principal function. The free acid and acid salts are neutralized, some of the invert sugar is converted to the acid salts and some decomposition of the non-sugar





Flow sheet showing process of stone and lime manufacture.

bodies. There is a mechanical action in the settling and filtering, whereby various impurities and suspended particles are separated. Lime is used in the treatment of cane sugar juice in much the same manner as described in the beet sugar refining. The heated juice as it comes from the pressing rolls is treated with a milk of lime suspension to coagulate as well as neutralize as much of the impurities as possible. Careful control is exercised over the lime addition and in some cases the excess is corrected by the addition of phosphoric and sulfuric acid. Excessive liming decomposes the invert sugar and causes the formation of dark, bitter lime compounds. The limed juice is then run into vats, heated and then allowed to settle or run into other settling vats from which the clear juice is separated and further evaporated and then to the refinery process. In the beet sugar industry some of the lime is burned in a kiln at the refinery to produce carbon dioxide, which is used in the carbonating process but much more lime is required than that necessary to produce the required amount of carbon dioxide. In the cane sugar refining no carbon dioxide is used and as a result lime is usually purchased for that process. High calcium lime is used for this process because magnesia is not completely precipitated in the process. Sulfates and soluble silica are especially undesirable from the standpoint of the operation of the evaporators. Iron should be low because it tends to impart a gray color to the final product.

Soils

The effect lime has on clay soils in the so-called neutralization of soil acidity represents a reaction that has been studied from several points of view. One viewpoint is represented as the flocculation of the soil particles and the lime effectively does flocculate the clay particles and modifies the texture of the soil rendering it more open, friable and easier to till. This modification assists in the aeration, water movement and temperature changes, all of which are favorable to plant growth and a secondary improvement in bacteriological condition. The latter condition has many ramifications that are highly important. The other viewpoint and one which may be entirely compatible with the first is the base exchange reactions of the montmorillonite clays which is the result of lime additions to soil.

Flotation

In the mining industry where flotation separations are practised, lime is used as a coagulant to settle fine sands and slimes and has the same flocculating effect on most powdered minerals in suspension as it has on clays such as china clay, talc, etc. This greatly reduces the time of operation and increases the efficiency of the separation.

Water and Sewage

In the treatment of water for municipal and industrial uses, lime coagulates the suspended water and makes it possible to clarify the water. Lime has the same effect in the treatment of sewage. The subject of sewage and water treatment will be covered more fully in another section.

Gas Absorption

Lime functions as an agent for the absorption of gases. The basic function of lime is used to reduce the acid reaction

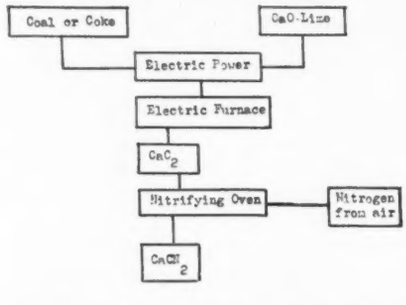
in numerous gases in order to reduce corrosion as well as to form the calcium salts of some of the acids. There are a few cases where the dry powder is blown into stack gases to correct acidity of sulfur fumes in contact with fabric collectors and this is a direct acid-alkali reaction.

In the manufacture of acetic acid the vapors of wood distillation are passed through a milk of lime suspension with the formation of calcium acetate or acetate of lime which is subsequently distilled with sulfuric acid to form acetic acid.

Lime is used to absorb chlorine gas to form various chlorides and chlorates. Chloride of lime is made by absorbing the chlorine with hydrated lime. The hydrate of lime is scattered out in a thin layer to effect the absorption of chlorine and the resulting product is sold as bleaching powder. The transportation of liquid chlorine in drums and tank cars has greatly reduced the use of bleaching powder and in its place we find the chlorine is absorbed in a suspension of lime to form calcium hypochlorite bleaching liquor which is used extensively in the bleaching of paper pulp stock, which was previously described. A further step in this same process of absorption of chlorine is represented by the production of calcium perchlorate, which is another of the chlorine compounds manufactured for bleaching and antiseptic use. The chlorination of a milk of lime suspension requires careful manipulation and controlled conditions. The absorption of sulfur dioxide by a milk of lime suspension in the preparation of sulfite cooking liquor is another process of gas absorption by lime which finds extensive use in the production of sulfite paper pulp.

In the fixation of atmospheric nitrogen lime is used in the manufacture of calcium carbide, which is subsequently treated with nitrogen at high temperature to produce cyanamide.

$$CaO + C \rightarrow CaC_2 + O$$
$$CaC_2 + N_2 \rightarrow CaCN_2 + C$$
$$CaCN_2 + H_2O \rightarrow CaCO_3 + NH_3$$
$$CaCN_2 + NaCL + C \rightarrow NaCN + CaCl_2$$



In the purification of artificial gas lime is used to absorb sulfur dioxide and hydrogen sulfide gas to prevent corrosion by the gas in contact with metal.

The absorption of carbon dioxide gas by lime is used to make precipitated chalk and whiting. The precipitation of calcium carbonate as chalk or whiting must be carried out under very carefully controlled conditions in order to control the particle size and gradation of particle size. These two factors make the chalk suitable and desirable for different types of coating in paper use as well as for paint extenders and rubber. The temperature of the milk of lime suspension, concentration and rate of carbonation all have a bearing on the particle size. It is possible under controlled conditions to form calcite rhombohedrons of extremely uniform size and it is also possible to precipitate the calcium carbonate as aragonite in very uniform needle-like crystals. One of the processes for the separation of magnesia from dolomite is based upon the precipitation of the calcium in the dolomite as calcium carbonate crystals large enough and uniform in size so that they settle out rapidly leaving the magnesia suspended in the solution as hydroxide. This process requires very careful selective carbonation of the calcium so as to avoid the formation of any magnesium carbonates which are soluble.

Dry feed chemical machine for water and sewage treatment process. Courtesy, Infilco, Inc.

Glass Manufacture

The technology of glass manufacture has experienced a great many changes in recent years both mechanically and chemically. The improvements and developments in the mechanical handling of glass have increased the problems of batch control and temperature control. Perhaps these developments have only emphasized the importance of the control of the chemical batch and the temperature of the melt with respect to the final properties of the finished product.

Lime is also used in the manufacture of structural and bottle or container glass and the production of this type of glass is largely a continuous process on highly mechanized equipment. Lime functions as the alkaline earth metal in the glass batch and roughly 10 per cent. of lime as CaO is added. Both high calcium and magnesium lime is used in the manufacture of glass. The iron content of the lime as well as all other components of the batch is important and must be held very low. In bottle and container glass 0.5 per cent. Fe_2O_3 is sometimes permitted but on structural glass the minimum is much lower. The lime glasses are used for hand blown window glass, machine cylinder method, the Colburn Process, which is a continuous sheet drawing as employed by the Libby-Owens-Ford Company and the Fourcault Process as used by the Pittsburgh Plate Glass Company. The lead glasses are used for special purposes such as optical glass, thermal glass, chemical glass, cut glass and colored glass.

Insecticides

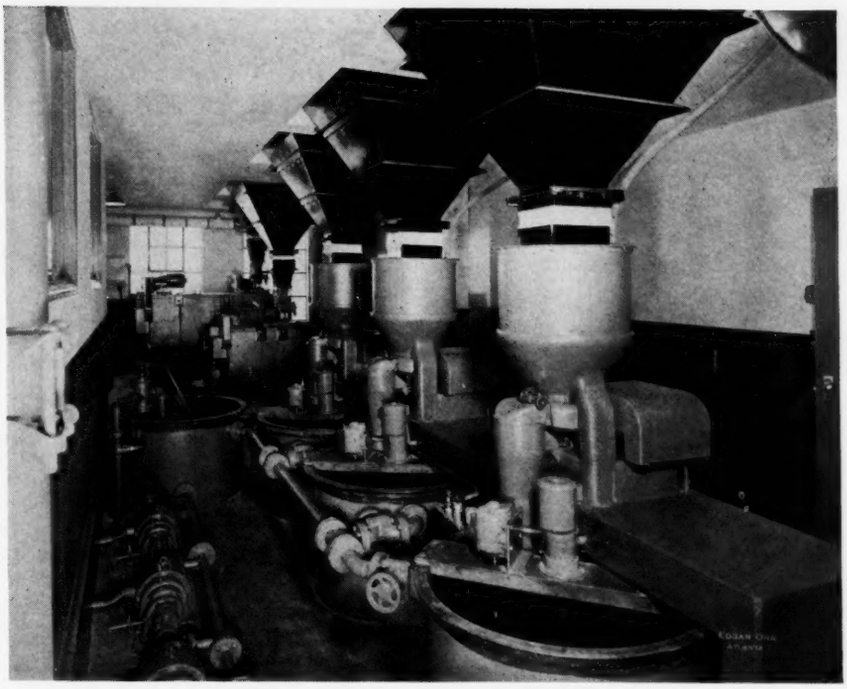
The manufacture of insecticides and fungicides finds a very wide and general use for lime. Some of the more important functions of lime are found in the manufacture of calcium arsenate, lead arsenate, bordeaux mixture, paris green and lime sulfur spray mixtures. Calcium arsenate is manufactured by neutralizing arsenic acid with a milk of lime suspension to form calcium arsenate which is a gelatinous white precipitate that is diffi-

cult to settle or filter. The suspension is dried to a powder or cake and then pulverized; lime as hydrate is generally added to extend it and frequently other materials are added to hold the material in suspension as it is used.

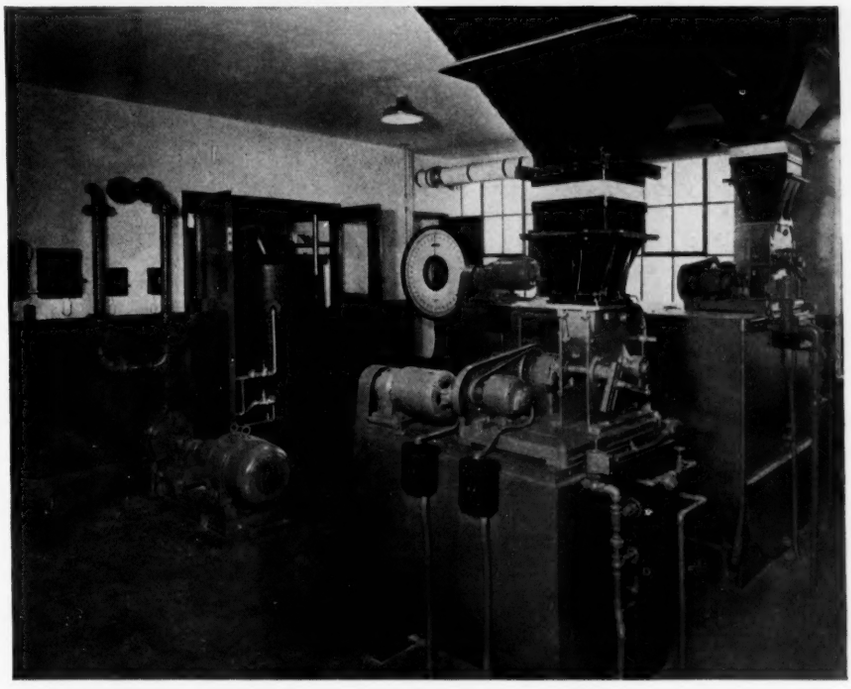
In the manufacture of lead arsenate, lime is used to neutralize the excess arsenic acid and this is usually done by mixing with hydrated lime. The lead arsenate is made by mixing a solution of litharge with arsenic acid using a proper catalytic agent and then drying the resulting product. Hydrated lime is used to further dilute the lead arsenate powder before packaging for sale.

Bordeaux mixture is prepared with lime and copper sulfate mixing approximately equal parts of high calcium quicklime and copper sulfate. Hydrated lime can be used equally well and the reaction is carried out in rather dilute solutions. The reaction product can be used as such or concentrated to a paste for shipment.

Lime sulfur is prepared by boiling lime paste and sulfur together. The mixture is essentially a mechanical mixture. Paris green and many of the other insecticides are made by mixing high calcium hydrated lime with dry powders, etc



Infilco dry feed chemical machines at Clayton Sewage Plant, Atlanta, Ga.



Infilco lime feeders and slakers. Clayton Sewage Plant, Atlanta, Ga.

Ammonia Distillation

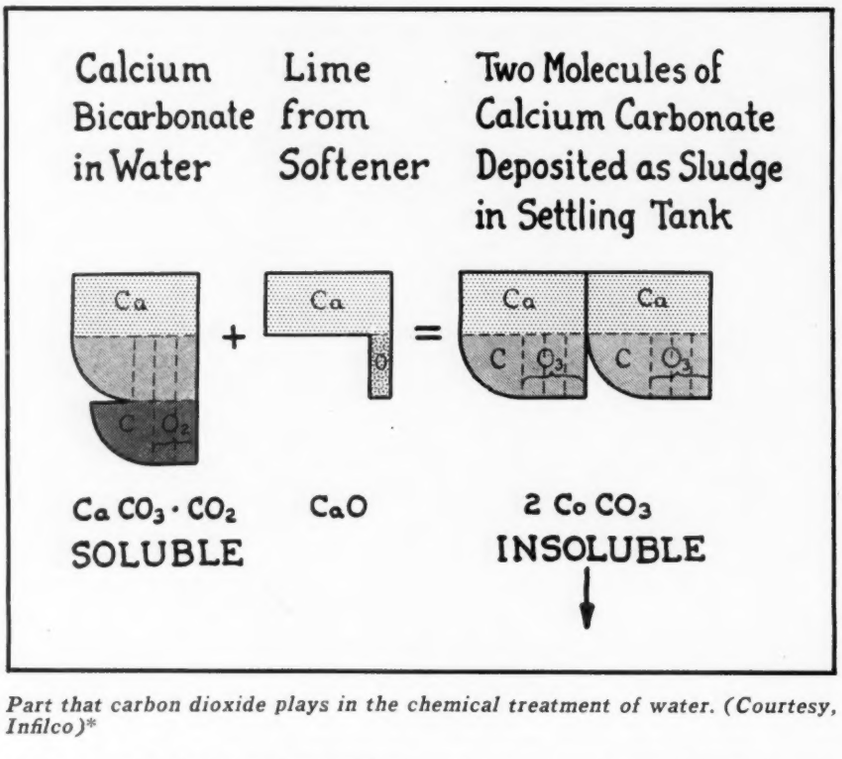
In the by-product coke industry, the ammonia is recovered as ammonium sulfate by reactions with sulfuric acid. Lime is used to free the fixed ammonia which is present in the gas as sulfate or chloride and this ammonia so liberated is combined with the free ammonia present in the gas which is liberated from the sulfide, hydroxide or carbonate by heat alone and sent to the saturators where ammonium sulfate is produced. In regular coke oven practice only a small amount of the ammonia in any form goes to the ammonia still, the greater portion passes directly to the saturators while still in the coke oven gas.

Water Treatment

Our water supply is perhaps the most important mineral resource upon which we depend for our very existence. The treatment of water in the mind of nearly everyone means municipal water supply and that is almost entirely correct for the municipal supply in most cases is also the industrial supply. Many of the comforts of our present urban living can be directly attributed to the functions of lime as a clarifier, sterilizer and softener of the water we use. The technique of modern water treatment and the adaptability of available water supplies to municipal and industrial use affects very largely the development of many sections of our land. Some of the very large municipalities convey the water which is used many miles in order to get a suitable water.

The treatment of water presents a complex problem at times and each source of supply presents quite a different set of conditions. The treatment may be necessary in order to prepare the water for numerous industrial uses, to recover a desirable material that is in solution or it may be for human consumption. In the first case the requirements call for the precipitation or coagulation of suspended impurities which represent hardness or the soluble material that is to be recovered. In the second place the treatment is to remove hardness in the water to sterilize the water and to remove bacteria.

In the softening of water with lime, we depend upon the relative solubility of various salts that may be formed by lime treatment to reduce their percentage. Hardness of water is classified as temporary and permanent. Temporary hardness in water refers to the bicarbonates, usually because there is dissolved carbon dioxide in water and the carbonates of calcium and magnesium from river beds furnish this dissolved calcium and magnesium. The addition of lime to water containing temporary hardness reacts



*Part that carbon dioxide plays in the chemical treatment of water. (Courtesy, Infilco)**

with the carbon dioxide to form calcium carbonate and the water deprived of its carbon dioxide causes the dissolved calcium carbonate to precipitate, the magnesium bicarbonate reacts with lime to form the less soluble magnesium hydroxide and calcium carbonate. The permanent type of hardness represents sulfates, chlorides and nitrates. The sulfates of calcium and magnesium are both soluble in water and so their treatment requires the addition of sodium carbonate for their removal. The carbonates of calcium and magnesium are thus formed and the soluble sodium sulfate goes into solution with little harm to the water. Small amounts of chloride and nitrate are removed with the sulfates.

In the purification of water for human consumption, the above softening is very desirable but in addition clarification and bacteria removal are also necessary. The addition of lime to turbid water often flocculates the suspended matter to large enough particles that it will settle and leave a clear water. At times it is necessary to add alum to increase the floc together with lime in order to blanket the suspended material and to sterilize and envelope the bacteria so that it is carried down with the floc.

In the production of metallic magnesium, lime is used to separate the magnesia from the rest of the brine or sea water as the case may be. The soluble magnesium chloride reacts with the calcium hydroxide in either high calcium or dolomitic lime to form the slightly soluble magnesium hydroxide which can be flocculated into a particle size that can be separated from the solution. This method is used to recover magnesia from sea water and the reaction using dolomite is used in treating dolomitic lime with sea water to replace the calcium with magnesium for periclase refractories. The treatment of sea water or bittern with lime is an important step in our war production effort to get magnesium metal.

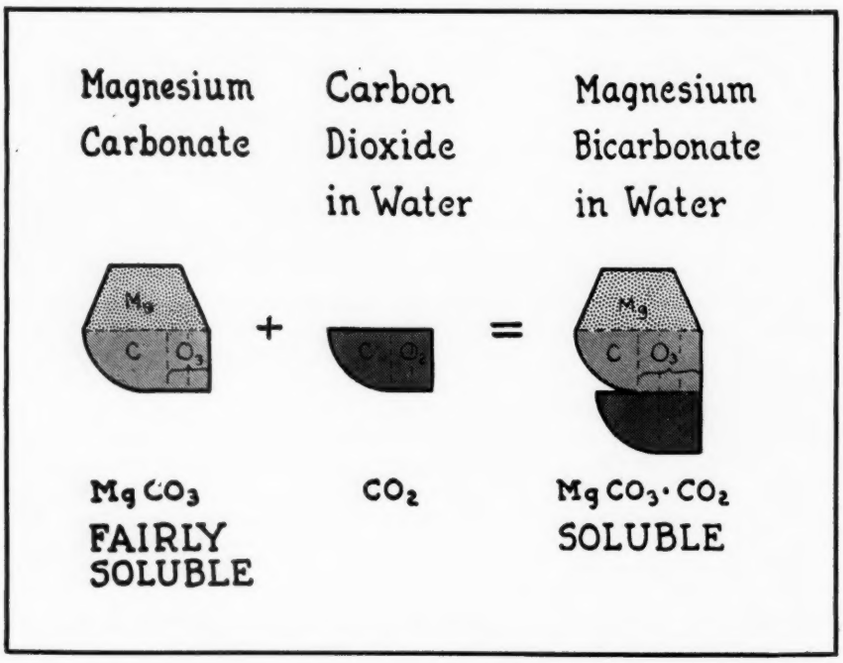
Sewage

The treatment of sewage has advanced very rapidly in the last fifteen years both from the standpoint of the number of treatment plants in operation and in the efficiency of the treatment itself. The type of treatment of sewage must be varied to suit the composition of sewage to be treated. In an industrial area where the wastes are slightly acid or alkaline, the treatment is quite different from straight domestic sewage. The chemical treatment consists in the removal of the suspended bodies that do not settle out and require a coagulating agent. Lime is used in this part of the process alone or with alum or ferric chloride or sulfate which together produce a heavy floc that carries down with it the suspended material. Lime is also used very effectively to control the pH of the solution in order to create the proper environment for the growth of bacteria. The sludge so formed by chemical treatment must be stable so that it can be disposed of without creating a nuisance by further decomposition and if it is correctly treated, it will be entirely satisfactory to use as a fertilizer. The sludge when so used should be distributed evenly with a correct application of lime to prevent the soil from becoming acid.

Magnesium Metal

Dolomitic quicklime has a most important place in the manufacture of magnesium metal. Magnesium, in the form of castings rather than sheets, will no doubt be used by builders of airplanes and automobiles by developing designs which will contemplate wider use of large cast pieces to which magnesium lends itself extremely well. Such modifications of design if and when they occur will greatly stimulate the use of this very significant metal.

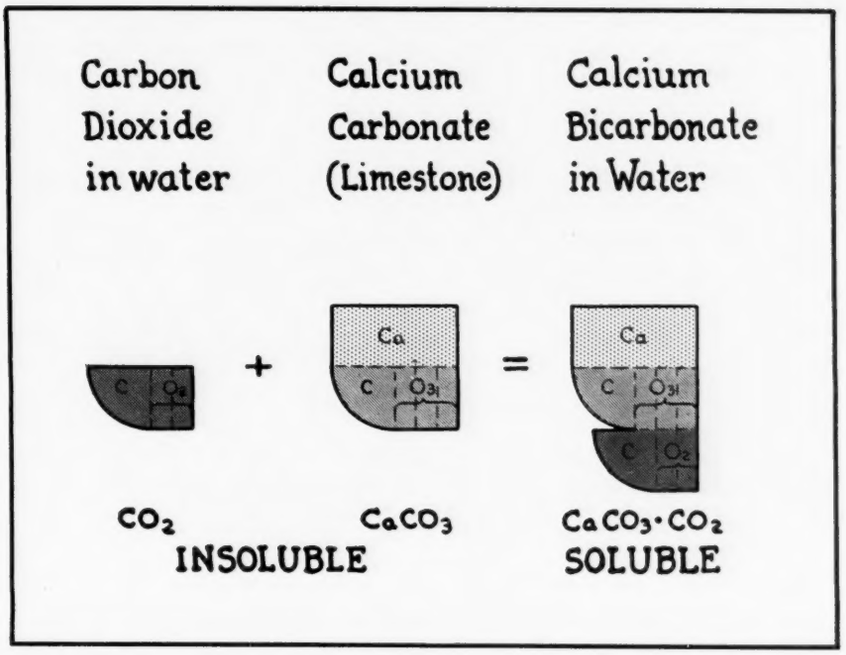
There are a number of methods of production which uses dolomite as the source of magnesium. Dolomite contains 13.1 per



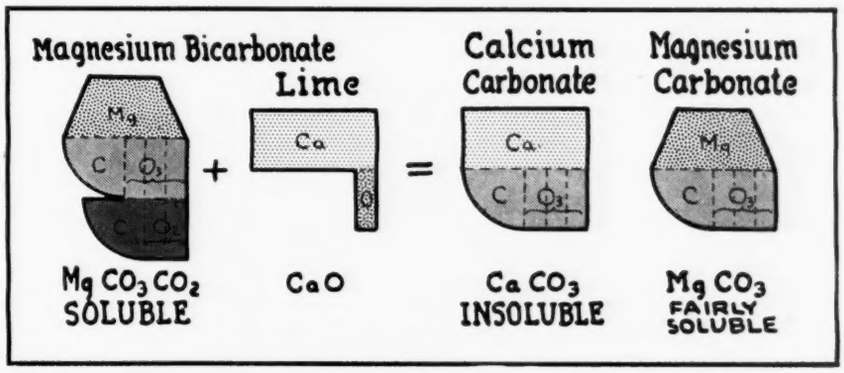
Why magnesia requires more lime to remove it from water than from limestone. (Courtesy, Infilco)*

cent. magnesium metal, underground brine 0.8 per cent. and sea water 0.12 per cent. to 0.14 per cent. In the Pidgeon Process the dolomitic lime itself is heated with ferro silicon in a nicrome retort under slight vacuum and the magnesium metal sublimes and is condensed in the cool end of the retort. The ferro silicon combines with the oxygen liberated in the breaking down of the magnesium oxide, the calcium oxide combines with the silicon leaving the iron practically free. The magnesium metal is collected in the cool end by a suitable means and removed. The temperatures necessary for this process are not excessive and are entirely within the limits of the retort used.

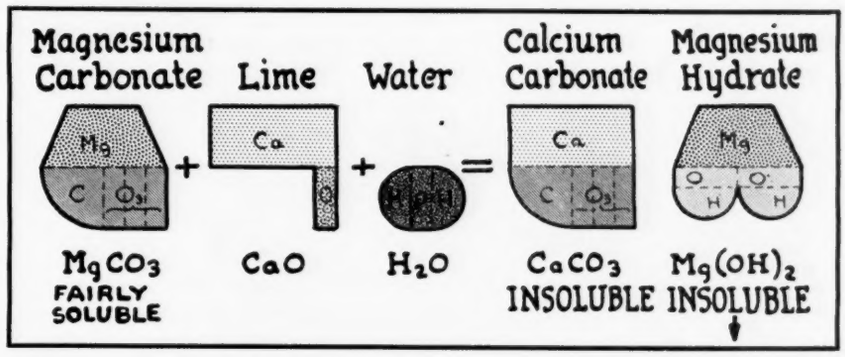
Sea water is treated with dolomitic lime and the magnesium chloride in sea water which is a very small percentage reacts with the calcium hydroxide to form magnesium hydroxide (insoluble) and calcium chloride which is soluble. The magnesium oxide in the dolomitic lime hydrates to magnesium hydroxide. This hydrate of magnesium is only slightly soluble in water and presents a problem in settling because the state of diversion is very great. It must be flocced in order to get a precipitate that can be handled. The magnesium hydroxide so produced can now be calcined to produce periclase for electric furnace use or treated with hydrochloric acid to form magnesium chloride which is later electrolyzed in suitable cells to produce metallic magnesium and chlorine which can be taken back into the process.



*The insoluble limestone is deposited as sludge in the settling tank. (Courtesy, Infilco)**



*The first reaction when lime is added to water containing magnesium bicarbonate. (Courtesy, Infilco)**



*Adding more lime, the second reaction producing insoluble magnesium hydrate. (Courtesy, Infilco)**

* *Diagrams illustrating the use of lime in water treatment are reproduced with permission of Infilco, Inc., from Technical Bulletin 2004—"The Chemistry of Water Treatment."*

Dolomitic Lime Used

Dolomitic lime is also used to treat the magnesium chloride brines or bittern from salt water wells in exactly the same method as described in the preceding paragraph. The exception being that this brine or bittern contains a much higher concentration of magnesium chloride. After the precipitation of the magnesium as the hydroxide the process follows the same chemistry and presents the same difficulties.

In the Solvay Process for the production of soda ash, the ammonium chloride liquor instead of being treated with calcium hydroxide to liberate the ammonia for return to the process can just as well be treated with dolomitic quicklime or dolomitic milk of lime and have the calcium hydroxide in the dolomitic lime react with the ammonium chloride to produce calcium chloride, which is soluble, free the ammonia which passes off as a gas and is reused in the process leaving the magnesium hydroxide in the calcium chloride solution which can be separated out by flocculation. The so separated magnesium hydroxide is then converted to the chloride and electrolyzed to the metal.

Another process using dolomitic lime employs treating a dolomitic milk of lime suspension with the waste calcium chloride from the ammonia soda process and then carbonating the solution. The slurry when so treated with calcium chloride and carbon dioxide converts the calcium to calcium carbonate which precipitates and the magnesia to magnesium chloride (soluble). The magnesium chloride solution is electrolyzed to yield the metal after it has been concentrated. This process can be used in conjunction with the one just described above.

The American Balance Sheet in Oils and Fats

PART THREE THE CONCLUSION

By Walter J. Murphy, Editor
Chemical Industries

In conclusion, the author points out that he is just a reporter giving his review of world events and their relationship to fats and oils. He does not profess to be a soothsayer or a prophet. Nevertheless, he has rounded out his story in this third part to bring you up to date on what is what in oils and fats.*

Preparation of paints, Glidden Co. Pigment, oils and varnish are put into this mixing vat and mechanically agitated.

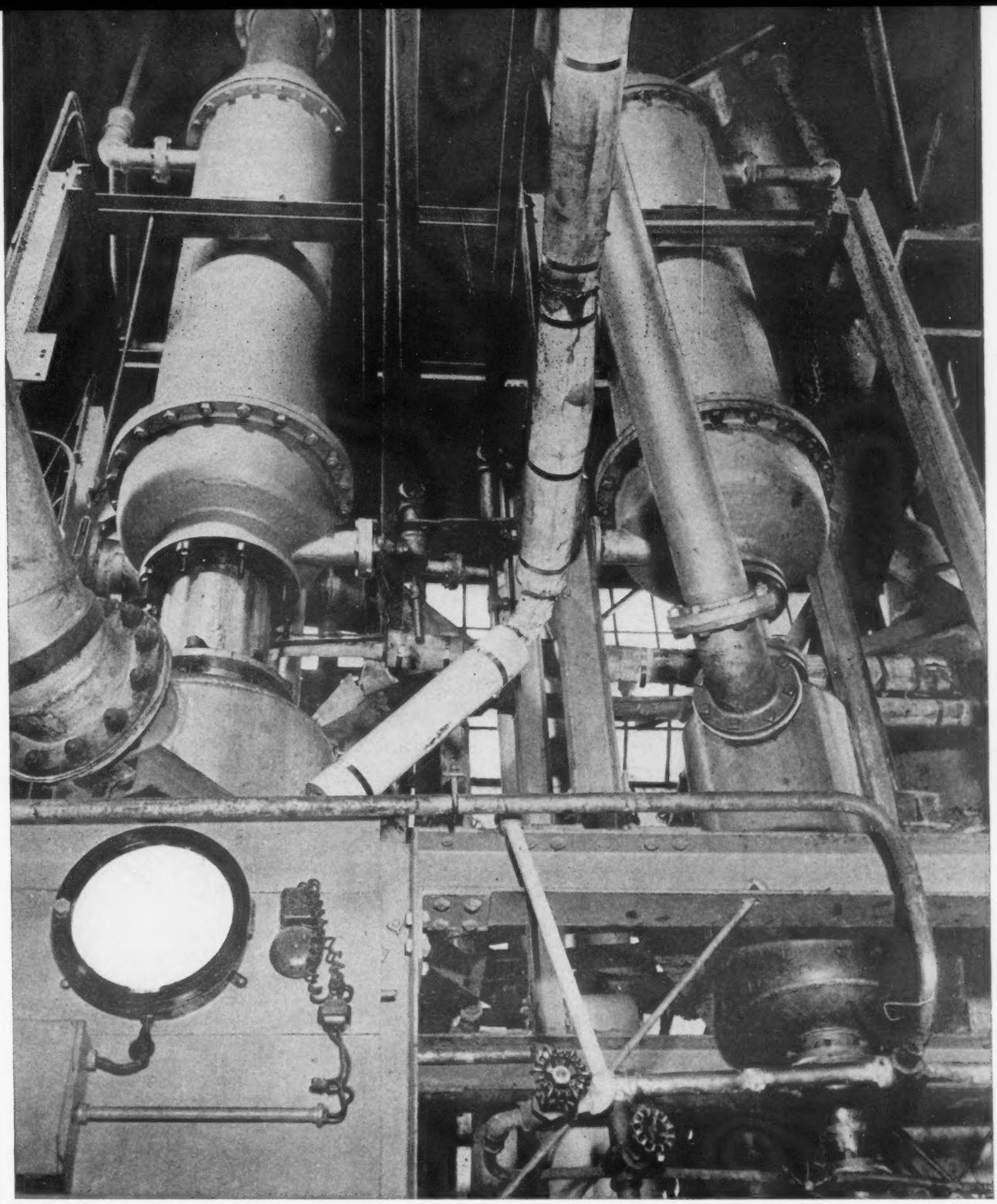
Preparation of paints, Glidden Co. Filling the containers from the storage vats after the paint has been manufactured.

IF it is true that wars have been lost through critically serious deficiencies in fats and oils, is it not likewise true that wars can be won by a superabundance of the same materials? There are many who hold to the belief that at the right psychological moment even the majority of Germans can be weened away from Hitler with the promise of what in good old American slang is called "a square meal."

While this may be simply wishful thinking, there can be no question but what when this war period ends practically a whole world will look to the Americas, North and South, for the necessary sustenance to carry on until the chaotic conditions in Europe and the Far East are corrected. Thus the Administration's program of the "depression thirties" of scarcity, of plowing crops under, of "birth control" for pigs, and slaughtering little pigs, must be forthwith placed in direct reverse. Perhaps the farm bonuses soon will be based not on how little the farmer can produce, but on

* Part 2 appeared in the May issue, pages 618-626.

Filtering of tung oil at a tung oil mill. U.S.D.A. photograph.



Various grades of fatty acids, boiled off as vapor from stills, are liquidated again in giant condensors to form different grades of pure distilled fatty acids. Giant condensors above are at Woburn Degreasing Co., Chemical Division, Harrison, N. J.

how much he can raise to feed the hungry mouths of millions and millions. Perhaps we can at a later date literally pour "oil on troubled waters" and again relive as a nation the story of the good Samaritan.

Very fortunately we have been showing some steady increases in fats production in the last few years. The 1941 output of 9.8 billion pounds was an all-time record and was an indicated gain of 13 per cent over the 1940 total. All indications point to a further increase in demand in 1942 over 1941 of some two billion pounds and this feat must be accomplished in the face of the startling fact that we normally import some 15 per cent of the total indicated consumption.

Individually we are interested in the outcome of any expansion plans for they primarily affect our waist line, but fats and oils are highly important raw materials as well in a number of industries. How will such industries fare over the next few years? Certainly we are not sure of all the answers, but a study of those industries, their requirements, their manufacturing processes, and their problems today, will aid in a better understanding of what they may face six months or a year hence. And, incidently, possibly supply a clue or two to the best solutions.

The very latest report of the United States Tariff Commission shows that fats and oils of animal and vegetable origin are used principally in (1) food products,

Fats, oils, and oil-bearing materials: United States tariff duties and excise taxes in effect December 15, 1941

("T. A." indicates that the tariff or excise tax status shown is provided for in trade agreements.)

(Cents per pound unless otherwise indicated)

Commodity	Duty	Excise tax	Total of duty and excise tax
Animal fats and oils			
Butter	14	...	14
Lard	3	...	3
Oleo oil and oleo stearin	½	1½	2 T. A.
Edible fats, greases, and oils, not specially provided for	20% ad val.	...	20% ad val.
Tallow	¼	1½	1¾ T. A.
Wool grease			
Containing over 2 percent free fatty acids	½	3	3½ T. A.
Containing 2 percent or less free fatty acids	1	3	4 T. A.
For medical use	2	3	5 T. A.
Neatsfoot oil and animal oils known as neatsfoot stock	10% ad val.	1½	10% ad val. + 1½ T.A.
Inedible fats, greases, and oils, not specially provided for	20% ad val.	3	20% ad val. + 3
Marine animal oils			
Sod oil	3c per gal.	...	.4 T. A.
Herring and menhaden oils	5c per gal.	3	3.67
Cod oil and cod-liver oil	....	...	....
Shark oil and shark-liver oil, including oil produced from sharks known as dogfish, not specially provided for	10% ad val.	1½	10% ad val. + 1½ T.A.
Halibut-liver oil	10% ad val.	...	10% ad val.
Marine animal oils, not specially provided for	20% ad val.	3	20% ad val. + 3
Whale (other than sperm) and seal oils	6c per gal.	3	3.8
Sperm oil:			
Crude	2½c per gal.	...	.33 T. A.
Refined	7c per gal.	...	.93 T.A.
Fish livers	....	...	....
Vegetable oils and oil-bearing materials			
Non-drying			
Coconut oil:			
From, or produced in the United States of materials from, the Philippines or any other possessions of the United States	....	3	3
Other imported as oil	2	5	7
Other produced in the United States from foreign copra	....	5	5
Palm oils:			
For tin or terne plate	....	...	... T. A.
Other	....	*3	3 T. A.
Palm-kernel oil:			
Rendered unfit for food	....	3	3 T. A.
Other	½	3	3½ T. A.
Babassu oil	....	...	... T. A.
Peanut oil	4	...	4
Kapok oil	20% ad val.	4½	20% ad val. + 4½
Teaseed oil	....	...	....
Vegetable tallow	....	...	....
Castor oil	3	...	3
Olive oil:			
Rendered unfit for food	....	...	....
Edible—			
Bulk (40 lbs. or over)	6½	...	6½
Packaged (less than 40 lbs.)	8	...	8
Almond oil, sweet	....	...	....
Cashew oil and cashew nut shell oil	....	...	....
Copra	....	...	... T. A.
Palm nuts and palm-nut kernels	....	...	... T. A.
Babassu nuts and kernels	....	...	... T. A.
Ouricury nuts and kernels	....	...	....
Muru-muru nuts and kernels	....	...	....
Tucum nuts and kernels	....	...	....
Peanuts:			
Unshelled	4½	...	4½
Shelled	7	...	7
Kapok seeds	....	2	2
Castor beans	¼	...	¼ T. A.
Semi-drying			
Corn oil	20% ad val.	...	20% ad val.
Cottonseed oil	3	...	3
Croton oil	....	...	....
Rapeseed oil:			
Rendered unfit for food:			
For rubber substitutes or lubricating oils	....	...	....
Other	....	4½	4½
Other	6c per gal.	4½	5.3
Sesame oil:			
Rendered unfit for food	....	4½	4½
Other	3	...	3
Sunflower oil:			
Rendered unfit for food	....	2¼	2¼ T. A.
Other	10% ad val.	2¼	10% ad val. + 2¼ T. A.
Cottonseed	1/3	...	1/3
Rapeseed	....	2	2
Sesame seed	....	1.18	1.18
Sunflower seed	2	...	2
Apricot and peach kernels	3	...	3
Drying			
Hempseed oil	1½	4½	6
Linseed oil	4½	...	4½
Perilla oil	....	4½	4½
Oiticica oil	....	...	....
Poppyseed oil	2	...	2
Rubberseed oil	20% ad val.	...	20% ad val.
Safflower oil	20% ad val.	...	20% ad val.
Soybean oil	3½ (not under 45% ad val.)	...	3½ (not under 45% ad val.)

(2) soaps, (3) paints, varnishes, and linoleums, and (4) a large variety of miscellaneous manufactures. In this country in 1940 some 67 per cent of the total consumption entered into food products, 20 per cent into soaps, eight per cent into coatings, etc., and five per cent into miscellaneous products. Of the materials entering into food products, butter alone accounted for over 23 per cent of the total consumption of fats and oils entering all uses, and lard, which is mainly consumed in cooking and baking, accounted for nearly 20 per cent of the total.

The same report goes on to say: "The percentages of total consumption of all fats and oils which have entered into the above mentioned categories of uses have not changed much in recent years; and the total consumption for all uses has increased only moderately. However, the proportions of domestic and of foreign materials entering into certain classes of uses have changed very considerably during the past few years."

And that last sentence really sums up the problem today. Just how successfully can we substitute domestic fats for the ones we can no longer import?

Domestic production accounted for 89 per cent of the total of 6.3 billion pounds of all fats and oils entering edible uses in 1938 and for 96 per cent of the total of 6.5 billions in 1940. We need have little fear of fats starvation in this country just as long as we can maintain inviolate the Atlantic and Pacific Coasts of North America.

Shortening

Cottonseed oil is the predominating oil in this field. In the period 1931-1940 it accounted for from 57 to 88 per cent of the annual consumption of all fats and oils entering into shortening. Soybean consumption in this field has been increasing steadily as domestic supplies became greater and in 1940 amounted to 18 per cent of the total. Palm accounted for

APPROXIMATE OIL YIELDS OF CERTAIN VEGETABLE OIL MATERIALS

Raw material	Oil yield
	Percent
Babassu kernels	63
Castor beans	45
Copra	63
Cottonseed	15.5
Flaxseed	34
Hempseed	24
Kapok seed	18
Palm kernels	45
Peanuts in the shell	25-30
Peanuts shelled	40-50
Perilla seed	37
Rapeseed	35
Sesame seed	47
Soy beans	15
Muru-muru kernels	[1]36
Tucum kernels	[1]44

[1] Estimated, based upon yields shown in "Vegetable Fats and Oils" by George S. Jamieson.

Source: U. S. Department of Agriculture.

10 per cent in 1936 but for less than three per cent in 1940. Edible tallow was the only other material which accounted for as much as three per cent of the total fats used in shortening in 1940.

In no year during the last ten years (1930-1940) did vegetable oils account for less than 87.6 per cent of the total consumption in shortening, and they accounted for 92.9 per cent of the total in 1940. In 1940 animal fats accounted for 6.2 per cent of the total and marine and fish oils for 0.9 per cent.

Shortening then does not present any special problem. Increased acreages given over to soybean and a boost in the cotton crop will more than offset the quantities of imported oils, mainly cocoanut and palm, generally finding their way into shortening.

Margarine

Introduction of margarine came about 1870 at the time of the first introduction of lard compounds. As in the case of early lard compounds, the first margarines were produced almost entirely from animal fats. In later years vegetable oils—particularly cocoanut, palm-kernel, peanut, cottonseed, and sesame—were employed in much greater proportions. The animal fats used are neutral lard, oleo stock (which is more often called abroad premier jus), oleostearin, and lard stearin. Formulas vary with manufacturers, but the general procedure is to select a mix that will have a melting point between 26 and 27½° C. Quite naturally the price of various ingredients at times determines formulas.

Actual manufacturing operation is relatively simple. The mixture is first melted, then cooled, and mixed with skim-milk to which a bacterial culture has been added. Agitation emulsifies the fat and the resulting product is chilled.

Over the last 10 years or so the proportion of vegetable oils used to those of animal origin has shown a tremendous expansion. A sharp decline in the use of imported vegetable oils in recent years has been caused largely by discriminatory excise taxes imposed by the various states on the use of such oils in margarine and by the imposition by the Federal Government of excise taxes on certain imported oils and oils processed from imported raw materials. As a practical example of what has happened—some 133 million pounds of cocoanut were used in 1931 and but 21 million in 1940. In 1933 cocoanut oil accounted for 75 per cent of all the fats and oils entering into margarine production, but in 1940 accounted for only eight and one-half per cent. Of the vegetable oils employed, cottonseed is now definitely in first place, followed by soybean, cocoanut, and babassu. Margarine, like shortening, should present no particularly hard nuts to crack.

Fats, oils, and oil-bearing materials: United States tariff duties and excise taxes in effect December 15, 1941—Continued

Commodity	Duty	Excise tax	Total of duty and excise tax
Tung oil	....	...	....
Walnut oil	....	...	....
Hempseed	....	1.24	1.24
Flaxseed	32½c per bu. of 56 lbs.	...	0.58 T. A.
Perilla seed	....	1.38	1.38
Poppyseed	16c per 100 lbs.	...	.16 T. A.
Rubberseed	....	...	....
Soybeans	2	...	2
Tung nuts	....	...	....
Expressed or extracted oils, not specially provided for	20% ad val.	...	20% ad val.
Nut oils, not specially provided for	....	...	....
Seeds and nuts, not specially provided for (when oils derived from them are free of duty)	....	...	....
Fatty acids			
Stearic acid:			
Valued not over 8c per lb.	25% ad val.	[1]	25% ad val. + [1]
Valued over 8c per lb.	15% ad val.	[1]	15% ad val. + [1] T. A.
Oleic acid	20% ad val.	[1]	20% ad val. + [1]
Linseed oil, fatty acids	20% ad val.	4½c	20% ad val. + 4½c
Fatty acids, not specially provided for	20% ad val.	[1]	20% ad val. + [1]
Salts derived from fats and oils or fatty acids, not elsewhere specified; fatty alcohol and fatty acids sulfated and salts of fatty acids, not elsewhere specified	25% ad val.	[1]	25% ad val. + [1]
Hydrogenated or hardened fats and oils	4	[2]	4 + [2]
Lard compounds and lard substitutes	5	[2]	5 + [2]
Oleomargarine and other butter substitutes	14	[2]	14 + [2]
Fats and oils changed by vulcanizing, oxidizing, chlorinating, nitrating, or other chemical process	20% ad val.	[1]	20% ad val. + [1]
Combinations and mixtures of fats and oils with or without other substances	25% ad val.	[2]	25% ad val. + [2]

[1] Excise tax is at the rate applicable to the oil from which derived.
[2] Excise tax is at the rates applicable to the fats and oils contained in product.
Source: U. S. Tariff Commission.

Some 480 million pounds of fats and oils went into salad oils, dressings, etc., in 1940. Vegetable oils supply about 96-98 per cent of the total. Cottonseed supplies from 43 to 55 per cent of the total, followed by corn oil, cocoanut oil and soybean. Hardly a difficult nut to crack here either.

The Soap Industry

Americans are firm in their belief that "Cleanliness is next to Godliness" and even the impact of war is not expected to alter this belief. If we have to scrub with a soft vegetable soap of poorest quality aided by pumice—scrub we will. The average American family has been using about 150 pounds of soap products a year, or about $15 worth a family of five.

Soap sales reached a peak in the first half of 1941, according to the Association of American Soap and Glycerine Producers, that surpassed by almost 20 per

Specified vegetable and animal fats and oils: Average yearly price, 1931-40, and average monthly price, January-November 1941
(In cents per pound)

Year	Cottonseed oil P. S. Y.	Peanut oil, crude	Soybean oil, crude	Coconut oil, crude[1]	Tallow edible	Tallow packers prime	Lard prime contract	Butter creamery N. Y. extra	Margarine standard uncolored
1931	6.0	6.2	6.6	5.3	4.7	3.9	8.0	28.3	14.8
1932	3.8	3.6	4.2	4.5	3.5	3.2	5.0	21.0	11.2
1933	4.5	4.1	6.5	4.2	3.7	3.4	5.7	21.7	10.2
1934	6.5	6.0	7.2	3.9	5.0	4.2	8.3	25.5	9.8
1935	10.4	9.5	9.6	4.7	8.6	7.0	14.5	29.6	15.1
1936	9.8	8.8	8.9	5.3	7.9	6.6	11.5	33.0	15.3
1937	9.2	8.6	9.8	6.3	8.6	8.2	11.7	34.3	15.6
1938	7.9	7.1	6.9	3.4	6.1	5.6	8.6	27.8	14.6
1939	6.6	6.1	6.2	3.4	5.5	5.4	6.9	26.0	13.3
1940	6.2	5.7	5.4	3.0	4.6	4.5	5.9	29.5	11.8
1941:									
January	6.4	5.6	5.9	3.3	5.4	5.0	5.7	30.8	11.8
February	6.2	5.3	5.7	3.4	5.1	4.9	6.2	30.8	12.0
March	7.1	6.2	6.5	4.3	6.0	5.6	7.0	31.2	12.5
April	8.6	7.9	8.1	5.6	7.6	7.2	8.3	33.1	13.0
May	10.5	9.5	9.5	6.9	8.2	8.1	9.5	35.6	13.0
June	11.5	10.3	10.5	7.0	8.2	7.9	10.1	35.6	13.3
July	11.8	11.1	10.8	7.4	8.1	8.0	10.4	35.1	14.0
August	11.9	11.2	10.2	7.4	8.3	8.1	10.3	35.5	14.0
September	13.6	12.7	11.2	7.5	9.0	8.7	11.1	36.9	14.0
October	12.9	12.1	11.2	7.6	9.2	9.0	10.4	35.4	14.0
November	12.4	11.9	10.9	7.6	8.9	8.8	10.4	36.1	14.0

[1] Does not include tax of 3 cents per pound on first domestic processing, effective May 10, 1934.
Source: U. S. Bureau of Labor, except for peanut oil commencing with 1940, which is from the U. S. Department of Agriculture.

Physical Characteristics of 20 Important Vegetable Fats (Average)**

Product	Sp. Gr. 15°/15°	Ref. Index	Setting Point	Sap. Pt. or Value	Sap. Eq.	Iodine absn. %	Combined Fatty Acids		Free Fatty Acids			
							Titer	M. Pt.	Acid Value	As Oleic Acid	% Unsap.	Melting Point
Vegetable												
Babassu	0.869/100° (water at 15°)	1.449/40°	22-23°	247-253	221-227	12-16	23-24°	25°	6	2%†	0.5%	22-26°
Castor	0.950-0.974	1.480/15°	-10° to -18°	176-187	300-318	81-89	3°	13°	03-4	0.15-2%	0.3-0.6%	
Chinawood	0.936-0.949	1.523/15°	2-3°	189-195	287-297	160-180*	31-37°	35-44°	0.12	0-6%	0.4-1.0%	
Cocoanut	0.926/15° 0.874/99° (water at 15°)	1.443/60°	19-23°	250-260	216-225	8-10	20-22°	24-27°	5-13	2-5%†	0.2%	24-28°
Corn	0.920-0.928	1.477/15.5°	-10° to -15°	188-193	291-298	117-130	15-19°	17-22°	2-20	1-10%	1.5-2.5%	
Cottonseed	0.913-0.930	1.474/15°	Ca 0°	191-196	286-294	103-111	33-38°	34-40°	2-6	1-3%	0.7-1.6%	
Hempseed	0.925-0.933	1.475/15°	-15° to -25°	190-195	287-296	145-165	15-17°	17-21°	...	...	1.0-1.3%	
Kapok	0.923-0.926	1.466/40°	Ca 0°	189-196	286-297	86-98	27-32°	32-36°	2-20	1-10%	0.7-1.1%	
Linseed	0.932-0.938	1.484/15°	-18° to -27°	189-196	286-297	170-185	19-21°	20-24°	1-8	0.5-4%	0.5-1.5%	
Oiticica	0.968	1.504/40°	.....	186-194	289-301	139-155*	.....	.....	2-6	1-3%	0.5-1.0%	
Olive Oil	0.914-0.920	1.471/15°	Below 0°	189-195	287-298	80-85	17-21°	22-28°	2-20	1-10%	0.5-1.5%	
Palm	0.921-0.925/15° (water at 15°)	1.451/60°	31-39°	196-210	256-285	51-58	36-45°	44-50°	10-60	4-27%‡	0.3-0.6%	27-30°
Palm-Kernel	0.930/15° (water at 15°)	1.443/60°	19-24°	243-250	225-230	15-18	20-25°	25-28.5°	5-20	2-7%†	0.2-0.5%	25-30°
Peanut	0.916-0.921	1.473/15°	0-3°	189-196	286-298	85-98	23-29°	27-35°	2-6	1-3%	0.3-1.0%	
Perilla	0.930-0.937	1.483/20°	.....	187-197	284-300	180-206	.....	-4 to -5°	1-8	0.5-4%	0.4-1.5%	
Poppyseed	0.924-0.927	1.478/15°	-15° to -20°	189-196	286-297	132-143	15-17°	20-21°	1-10	0.5-5%	0.5-0.7%	
Safflower	0.923-0.928	1.477/16°	-13° to -20°	187-194	289-300	130-150	11-16°	16-18°	2-10	1-5%	0.7-1.5%	
Sesame	0.921-0.924	1.475/15°	-4° to -6°	188-195	288-298	103-112	21-24°	23-32°	1-10	0.5-5%	1-1.5%	
Soybean	0.924-0.927	1.468/40°	-8° to -18°	190-193	291-296	124-133	21-24°	26-29°	2-7	1-3.5%	0.2-0.6%	
Walnut	0.924-0.927	1.480/15°	-15° to -28°	190-197	284-296	140-150	13-16°	15-20°	...	...	0.2-0.4%	

** Digested from Hilditch's "The Industrial Chemistry of the Fats and Waxes"—D. Van Nostrand Co.
* Indefinite, owing to conjugated unsaturation.
† Calculated as lauric acid.
‡ Calculated as palmitic acid.

cent the previous six months' record—set in the second and third quarters of 1939.

In 1941 some 70 manufacturers, representing 90 per cent of the total soap production sold $326,123,270 worth of soap, 23.5 per cent more than in 1940. Liquid soaps were up 36.2 per cent, other soap 18.6 per cent.

Soapers took 1.7 billion pounds of fats in 1940 and 2.4 billion pounds in 1941. Animal fats and oils supplied a greater proportion of the total than vegetable oils not only in 1940, but in all the years of the 1930-1940 decade. Furthermore, in that ten-year period the proportion of animal oils used showed an upward trend whereas that of the vegetable oils declined. Marine mammal and fish oils supply on an average about 10 per cent of the total.

Inedible tallow is the most important single fat or oil employed and cocoanut comes next. The rub is that the total of cocoanut, palm-kernel, and babassu used year after year amounts to about 25 per cent of the total, even though the proportions of the individual oils change, sometimes even sharply. All three of these oils are imported, the first two wholly, or almost wholly from the Far East. These three oils are high in lauric acid content, the element in an oil that makes for quick and rich lathering. The soaper is really facing a problem here for no domestically produced oil has a high lauric content. Several ways of attacking the problem are open. Oils of high lauric content, like babassu, are available in large quantities in South America if the problems of licking the jungle, unsatisfactory labor, and transportation can be done quickly. It hardly seems likely. A more nearly logical answer is the chemist and his ability to produce synthetically fatty acids with just the right properties. This may not be done overnight. The chemist using distillation and now the relatively new technique of fractional distillation has been giving most of his attention to the matter of supplying fatty acids of value for "drying," for it was in this field that the first pinch was felt in this country when war in China shut off or materially reduced tung and perilla shipments.

Just what present stocks of cocoanut, palm, palm-kernel, babassu and other oils of high lauric acid content now in the continental United States amount to is not known, and might easily even be considered a military secret, since such a figure would be an indication of our by-product glycerine supplies, necessary for the manufacture of the explosive nitroglycerine.

There are many reasons to believe such stocks are reasonably large. Americans will hardly face much discomfort for months brought about by either soap of poorer than normal quality, or by the complete lack of soap. There is little to fear that the latter will occur—no matter what happens.

And we still have two "aces in the hole"—coal and petroleum. The hundreds of thousands of hydrocarbons present in both coal and petroleum offer readily available building blocks to make all sorts of synthetic organic raw materials and products, from plastics to vitamins, and including basic materials for soap making. It is highly significant that almost at the very moment when Japan was attacking Pearl Harbor and the Philippines and blocking out our supplies of cocoanut, palm, and palm-kernel oils, Dr. Martin H. Ittner, in charge of research for Colgate-Palmolive-Peet Company, was explaining to a spell-bound Perkin Medal audience that processes perfected in his labora-

tories using petroleum as a raw material offered insurance against any serious shortage of soap in an emergency.

Looking at the soap industry from a long-term point of view the following facts are worth mentioning:

The manufacture of yellow laundry soap from tallow and rosin instead of from cottonseed oil or other soft vegetable oils and rosin.

A larger proportion of white soaps and a smaller production of yellow laundry soap.

A switch in popular demand towards flakes, chips, granules, beads, and powdered soaps and away from bar soaps. The most important effect of these changes has been the decline in the use of cottonseed oil for soap-making and the rise of cocoanut in its place.

The comparatively recent introduction of the so-called soapless soaps. All sorts of dire things were expected to happen to the soap industry when this group of products were first reported. But soapers continue to make more and more soap and some of the more resourceful and larger soap companies have managed to secure firm positions in the soapless soap picture. Just in case, perhaps!

Soap oils may roughly be divided into three groups:

1. The hard oils which yield a quick-lathering soap producing plenty of foam though the lather dries quickly and is to some people irritating to their skins. These hard oils are solid at ordinary temperatures, and cocoanut and palm-kernel oils are the outstanding examples of this type available and used commercially. It is the type of soap made partially from such oils, that has shown the greatest expansion in use in the last decade.

2. Hard oils which yield slow-lathering soap, including tallow, animal greases, palm oil, and hydrogenated soft soaps, have for centuries been the backbone of the soap industry. Employed without some admixture of cocoanut or palm-kernel they form a hard, firm soap with slow solubility, but with small lasting bubbles. It is easily seen that for a really high class soap, while some substitution between class 1 and class 2 is possible and in fact most desirable, very definite limitations are placed on the soaper.

3. Soft vegetable oils, liquid at ordinary temperatures, such as cottonseed, corn, soybean, peanut, olive oil foots, sesame, linseed, and castor. Any appreciable interchange of these with the hard oils materially alters the type of soap, although desirable, within limitations.

With economics definitely out the window now for the duration the soap industry, like many other fields of industrial endeavor, will be free, yes may be forced to go "whole hog" on many of the processes that research men have been laboring to perfect for years.

One of the very first practical moves being made is a sizable increase in the soybean and peanut acreages for 1942. At a price soybean can be converted into almost any type fat desired by the soaper. Soybean may be hydrogenated to produce a good substitute for beef tallow in the manufacture of hard soaps. The same is true of peanut—again, of course, at a price, and peanut oil prices are higher than soybean.

One way or another—one process or another we will have soap and Americans' belief that "Cleanliness is next to Godliness" will hold firm and unchanged. It may not lather quite as well as we would like and are accustomed to, but then that good old American custom of the pioneer

Primary fats and oils: Stocks as of December 31, 1931-40, and as of September 30, 1941

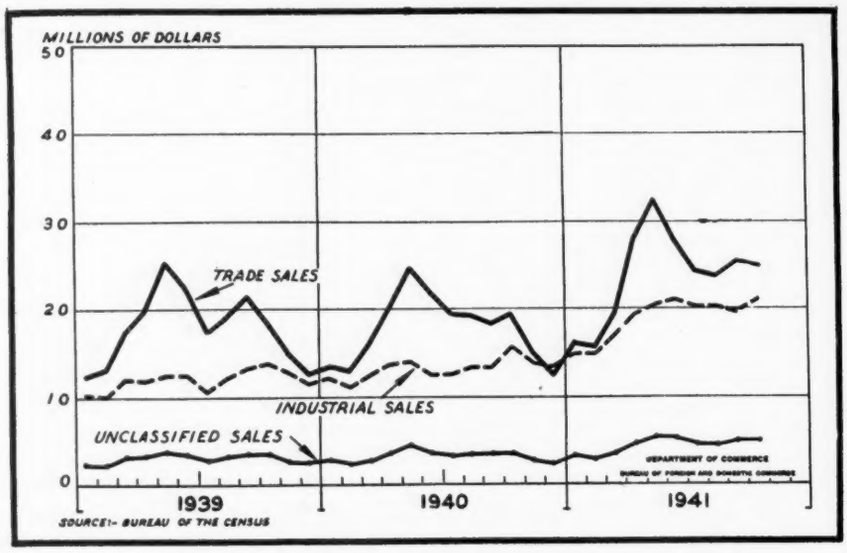
(In millions of pounds)

Fat or oil	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941[1]
Animal fats:											
Butter	27	22	111	47	40	61	43	129	55	41	203
Lard, including neutral	51	41	133	118	53	146	54	107	162	294	214
Oleo oil	5	6	10	6	5	4	6	6	7	5	5
Stearin, animal edible	5	4	4	3	6	6	5	5	4	5	5
Tallow, edible	5	4	4	7	12	9	9	8	8	7	7
Tallow, inedible	163	186	256	327	295	244	196	195	241	303	271
Neat's-foot oil	1	1	1	2	2	2	2	1	2	2	2
Total	257	264	519	510	413	472	315	451	479	657	707
Greases:											
Yellow	12	14	17	15	15	13	20	17	14	48	56
Brown	21	13	17	17	15	14	17	14	12	18	16
White	10	9	30	12	7	7	10	11	15	43	13
Garbage or house	22	13	11	16	15	15	15	8	5	4	7
Bone	4	2	2	1	3	1	2	1	2	3	1
Tankage	7	5	4	3	2	4	5	3	3	4	3
Recovered	5	6	2	2	1	2	2	.	5	6	7
Other (except wool)	4	3	4	4	3	3	3	5	.	.	.
Wool grease	6	7	9	4	3	2	2	3	5	7	5
Total grease and wool	91	72	96	74	64	61	76	62	61	133	108
Total animal fats and greases	348	336	615	584	477	533	391	513	540	790	815
Marine animal oils:											
Fish oil	101	109	110	170	164	161	106	146	167	132	118
Fish-liver oil	8	8	10	10	12	17	19	31	34	14	10
Marine mammal oil[2]	130	80	39	62	38	39	91	82	44	53	35
Total	239	197	159	242	214	217	216	259	245	199	163
Vegetable oils, crude basis:[3]											
Cottonseed	655	929	997	649	565	606	686	783	777	669	272
Coconut	204	136	199	189	153	76	178	217	191	258	204
Linseed	154	122	158	114	147	117	191	142	142	154	161
Palm	89	80	106	77	70	94	155	151	133	155	125
Tung	33	31	42	31	19	29	49	61	31	57	33
Corn	24	23	36	28	21	26	18	28	35	21	41
Soybean	19	17	14	19	31	34	62	77	72	95	68
Olive, edible	4	5	7	2	3	4	2	5	9	10	8
Palm-kernel	10	7	12	4	30	13	42	6	1	3	6
Peanut	7	4	3	27	30	29	25	28	21	43	34
Castor	12	12	14	12	8	12	19	17	12	21	16
Olive, foots	9	14	11	16	18	7	9	12	14	22	14
Rapeseed	4	2	4	13	12	14	5	3	7	7	12
Olive, inedible	1	1	3	2	3	2	2	1	3	3	1
Perilla	2	6	3	4	13	20	24	14	15	7	7
Sesame	11	3	4	3	11	12	5	[4]	[4]	2	[4]
Sunflower	[4]	3	9	1	1	[4]	.	.	.	.	.
Babassu	.	.	.	.	.	2	3	2	6	8	3
Other, not specified	6	2	1	5	11	5	17	16	13	12	18
Total	1,244	1,398	1,623	1,196	1,147	1,102	1,492	1,563	1,482	1,547	1,023
Compounds and vegetable cooking fats	25	26	27	28	40	45	46	56	57	54	50
Hydrogenated oils	27	21	23	18	22	22	22	24	28	27	28
Other products[5]	26	22	26	31	22	24	27	32	23	28	28
Crude oil equivalent of raw materials:											
Cottonseed	423	401	389	339	257	379	502	411	350	383	225
Flaxseed	69	58	50	34	79	53	61	44	90	131	229
Soybeans	18	12	16	32	87	59	69	133	170	107	6
Copra	32	35	75	19	50	13	62	46	44	44	46
Castor beans	7	6	11	13	9	8	9	9	6	9	36
Other[6]	2	6	5	7	12	3	1	3	1	1	2
Total	551	518	546	444	494	512	704	646	661	675	544
Grand total	2,460	2,518	3,019	2,543	2,416	2,455	2,898	3,093	3,036	3,320	2,651

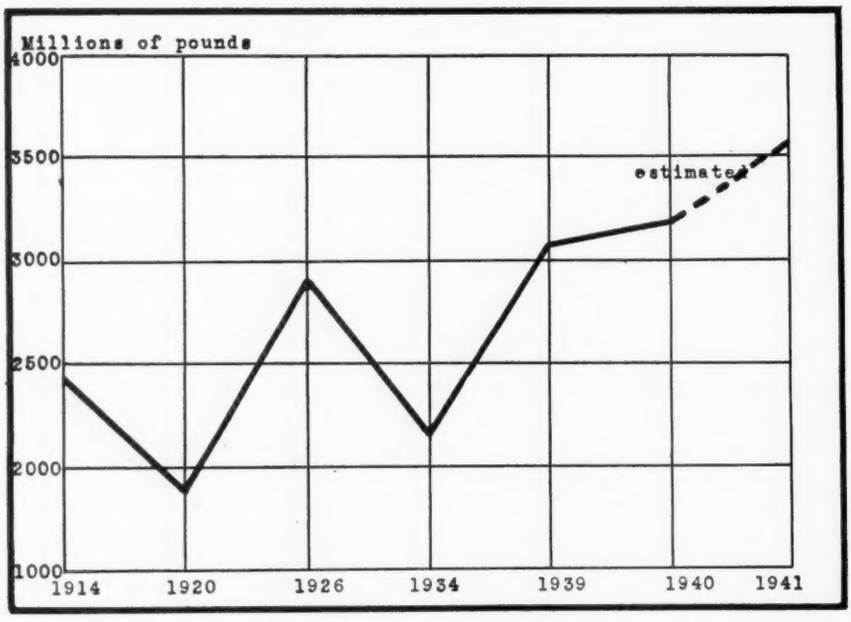
[1] Preliminary, as of Sept. 30, 1941.
[2] Stocks in bonded warehouses included; none reported since 1936.
[3] Refined oils have been converted to crude basis by dividing by the following factors: Babassu, cottonseed, corn, palm, and palm-kernel oils—0.93; coconut, peanut, and soybean oils—0.94.
[4] Less than 500,000 pounds.
[5] Includes inedible animal and vegetable stearin, lard oil, tallow oil, and red oil.
[6] Includes peanut, sesame seed, and babassu nut.

NOTE: Stock of margarine as of June 30 for the years shown in the above table ranged between 2½ and 4 million pounds.

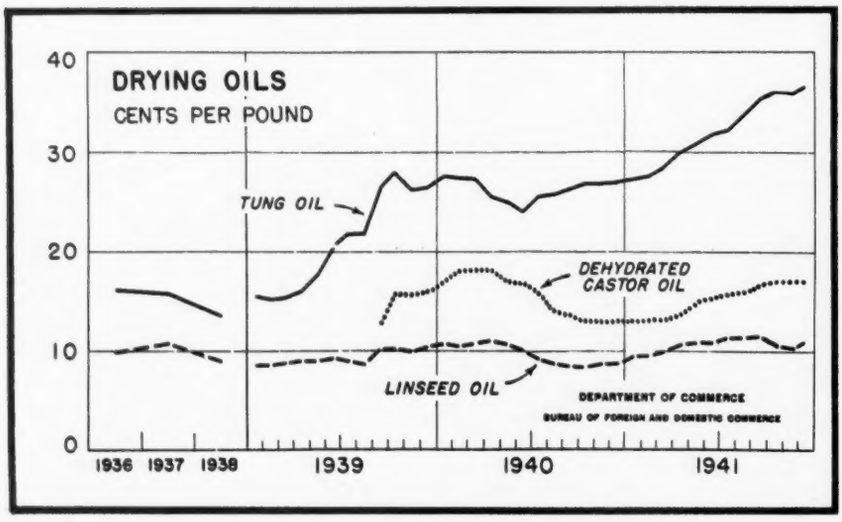
Source: Compiled from Bureau of the Census, Animal and Vegetable Fats and Oils, except butter and lard which are from the Bureau of Agricultural Economics.



U. S. Factory Sales of Paints, Varnishes, Lacquers and Fillers (By 680 manufacturing establishments).



U. S. Production of Vegetable Oils.



Wholesale Prices of Various Fats and Oils.

days the Saturday night bath was nourished along and thrived without benefit of liquid shampoos and bubble bath salts.

Paints, Varnishes, Linoleum, etc.

Total consumption of fats and oils in the coatings industries and printing inks in the decade between 1930 and 1940 varied from a low of 474 million pounds in the worst depression 1932 to a high of 830 million pounds in 1937. During the whole period linseed accounted for between two-thirds and three-fourths of the total annual consumption. Tung held on to second place throughout the 10-year period, accounting for between 13 and 20 per cent, except in 1940 when it hit a low of eight and one-half per cent entirely due, of course, to hostilities in China which prevented free flow of oil into the markets of the world. And in the case of tung that really means largely the United States.

In 1940 some 796 million pounds were consumed by the industries mentioned above in about the following proportions: paints and varnishes 83½ per cent; linoleum and oilcloth 14 per cent, and printing inks 2½ per cent.

Now here is the really "big" news. The imported oils (including those made domestically from imported materials) accounted for 80 per cent of the total used in 1937 but for only 44 per cent in 1940. Very obviously we have not been sitting idly by and progress, real progress towards self-sufficiency has been registered in recent years. Still the percentage of imported is much too high for either comfort or complacency and constitutes now both a serious threat and a real challenge to our technical ingenuity and ability to improvise quickly and thoroughly. Coatings are highly essential elements in our war machinery. To paraphrase—it must not be the story "For the want of a little paint the battle was lost."

Nor is the battle at all likely to be lost. There are many possibilities and really what it does mean is pushing ahead much harder along already well-charted paths. Among these are: Still heavier importations of oiticica, linseed in the form of flax, larger flax acreages in Canada and the United States; further increases in our domestic tung oil plantings, and, in this connection, it is interesting to learn that substantial increases in domestic tung oil are likely over the next few years as much of the plantings of the last decade will be coming into full production. Future for dehydrated castor is very promising and seems to be limited only by our ability to get large acreages planted to castor bean plants. Sizable increases in plant productive capacity for the manufacture of fatty acids of excellent drying qualities using both distillation and

the relatively new fractional distillation technique is close at hand.

Fractional distillation opens up tremendous possibilities not only in solving or helping to solve our "drying oil" problem but in many other ways. Pure commercial fatty acids in quantity and at reasonable prices and their derivatives such as alcohols, aldehydes, ketones, esters, metallic salts, nitriles, amides, amines, etc., really open up what is paramount to an entirely new branch of industrial chemistry that will prove highly useful in war and in conquering new scientific worlds in the peace that will follow.

Much encouraging news of a technical nature continues to find space in our technical journals. One large factor in fats and oils reports successful tests in pilot-plant operation of a process for the isomerization of linseed oil to a material similar in all respects to tung oil. The new oil which has been given the trade name "Conjulin," is made by the molecular rearrangement of linseed oil, whereby the greater part of the linoleic and linolenic acids are changed into the isomeric acids containing conjugated double bonds. Plans call for immediate erection of a commercial-size plant.

Fatty Oils in Lubricants

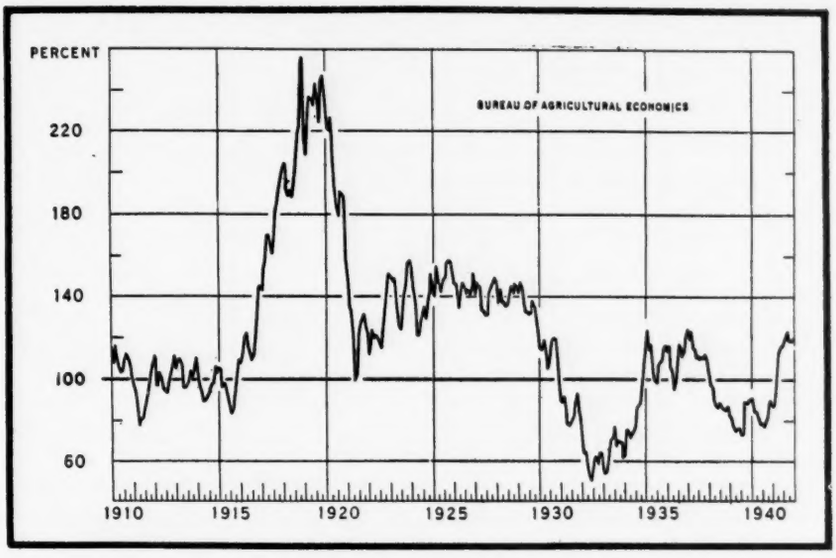
Because most people know lubricants through the automobile in which the oils used are almost entirely mineral in nature, few appreciate the importance of tallows, greases, and vegetable oils in making the "wheels of industry" hum. While in the past 35 years lubricants derived from petroleum have been gradually displacing the animal fats and vegetable oils, the turn-over is by no means, as yet complete. Oils of the non-drying type are essential. Fortunately the relatively small quantities consumed in the production of special lubricants offer little for industry to worry over.

Immediate Steps Taken

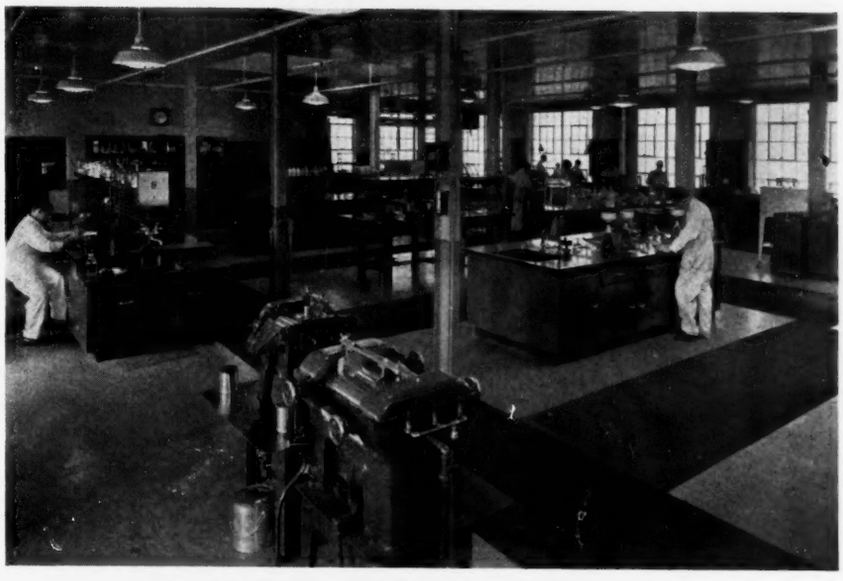
To meet an expected increase of approximately 10 to 15 per cent or even more in the demand for fats and oils, plans have been carefully laid to expand output of domestic oils. The Department of Agriculture has set as a crop goal the following increases over 1941: peanuts about 255 per cent, soybeans 154 per cent, and flaxseed 134 per cent.

More animal fats are being produced daily, and an increase of at least 1½ billion pounds of fats and oils is provided for in the farm program for the 1942-43 crop year.

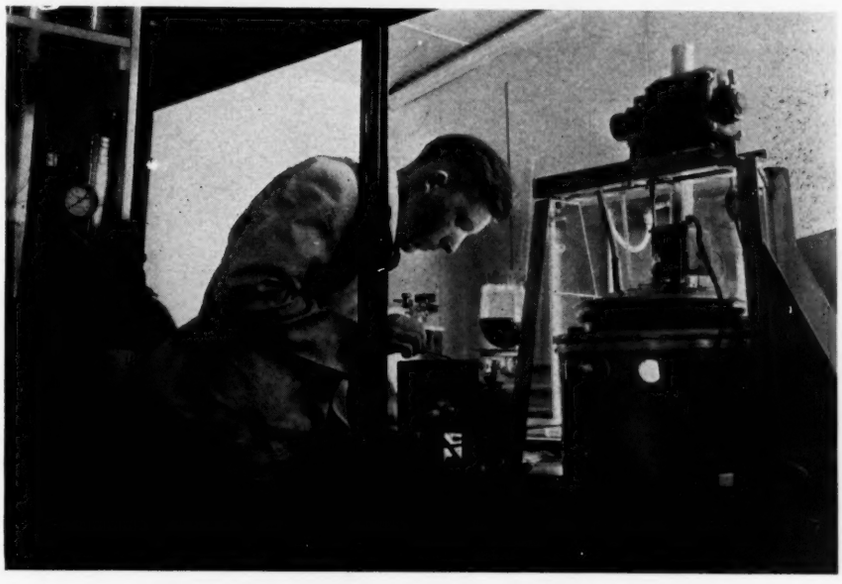
Government agencies have acted wisely and promptly in setting up necessary controls on both prices and inventories. Regulations have been issued clearly defining how stock of valuable imported oils



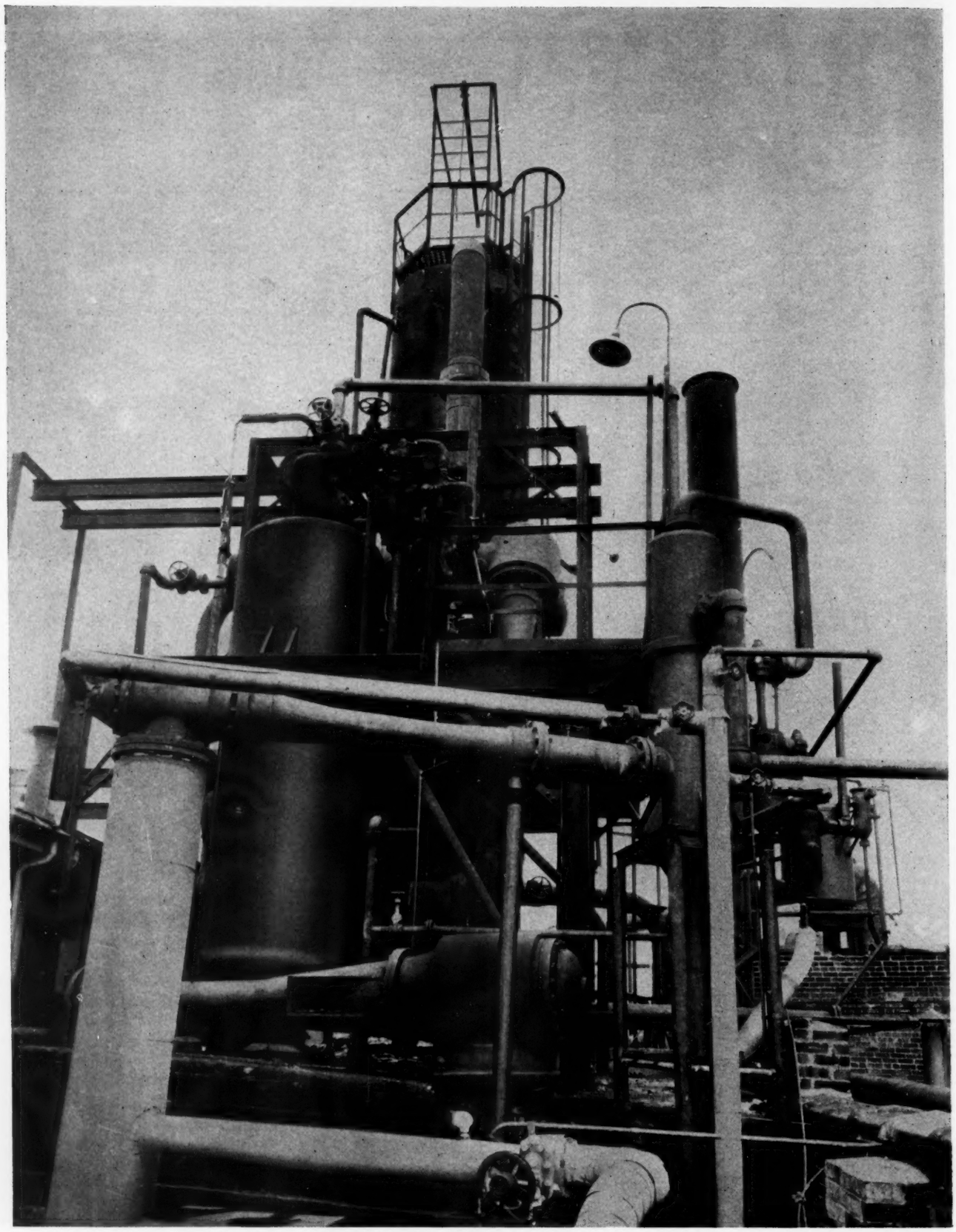
Wholesale Prices of Eight Domestic Fats and Oils 1910-1941. (1910-1914 equals 100)



Dry color laboratory, Sherwin-Williams Co.—Chicago plant.



Synthetic resin kettle in Sherwin-Williams laboratory.



Fractional distillation unit for commercial production of pure fatty acids, Armour & Co.

are to be processed. This is specially true of the oils high in lauric content for they provide the best yields of glycerine.

A War Production Board Order, effective April 1, operates to conserve the supply of high-glycerin-yielding vegetable oils by excluding them from edible and other non-glycerin-producing uses. Cocoanut oil, babassu oil, and other oils yielding a high percentage of glycerin are covered.

Soap manufacturers will be required to obtain full recovery of glycerin, and will be required to discontinue soap types in which the glycerin is retained. The WPB order also sets aside 20 per cent of all stocks of these oils, so that oils with high lauric-acid content will be available for irreplaceable uses, such as synthetic rubber.

Prices, of course, have been rising quite steadily now for the last few years

(prior to imposition of ceiling prices at the end of 1941). They are about 25 per cent above the 1927-29 price level, having increased nearly 75 per cent in 1941 alone!

Plans call for raising hogs to heavier weights to supply more lard. The meat industry is being asked to trim more fat in all operations. It is not unlikely that before very long the housewife will be asked to salvage fats and this will be just as important a part of the drive for collection of waste materials as are old paper, tin cans, old rubber, and rags. Even garbage offers distinct possibilities and plans may be formulated for a more extensive rendering of the leavings from our tables. With no incentive to conserve supplies, we have in the past wasted large amounts of these products that are converted in other countries. Whether we like it or not, or even appreciate it or not, the old adage "Waste not, want not" is full of significance right now.

One practical step is to exchange animal fats, of which we will have plenty, with countries in South America who use babassu for purposes for which lard and tallow is just as satisfactory.

The present capacity of soybean mills is about 96 million bushels. By working longer hours this can be increased to about 125 million bushels and this is just about what the 1942 crop is expected to amount to. If any difficulty does arise we can fall back on the cottonseed mills for their capacity is far in excess of actual needs.

The Balance Sheet's Future

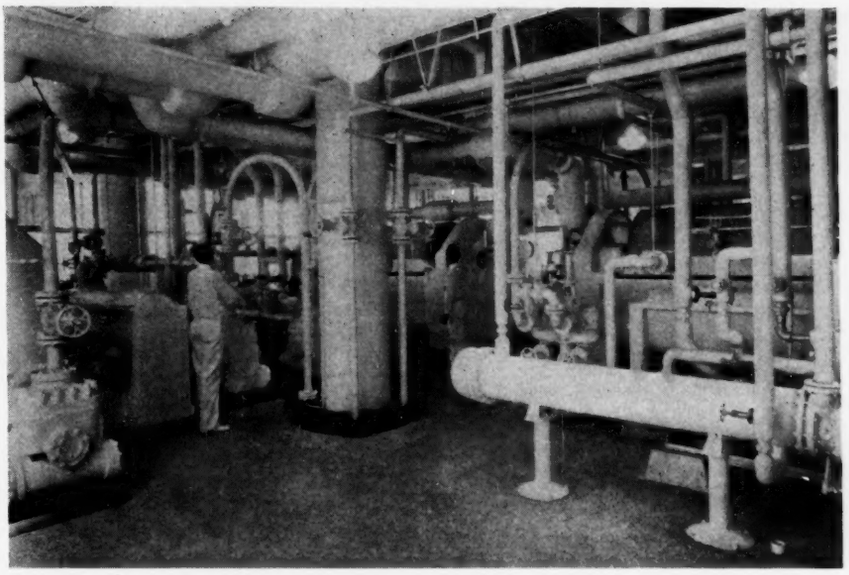
In 1940 the United States fats and oils balance sheet stood as follows: Imports, 1,684,770 pounds; exports 488,166,000 pounds. A debit balance of just about a billion pounds. In 1941 we imported two billion pounds. And remember fats and oils at least as such are not completely interchangeable, so that the debit balance is very close to the total import figure!

International trading in fats and oils has been "at sixes and sevens" for a decade or more.

Import restrictions by licenses, by duties, by quotas; restrictions in production; control over payments; difficult barter business; disregard of contracts by governments; currency devaluation; failures in corners of raw materials; failure of the gold bloc; fears of war and war; sanctions; government-controlled marketing agencies; compensatory taxes; processing taxes; floods, droughts and cyclones—all these and perhaps a great many more complications that escape the mind momentarily have created a situation that baffles any simple analysis.

Who can tell what the next decade will mean in international relationships? Will the nations agree to free interchange of the world's supplies of natural raw materials without setting up artificial barriers in attempts to gain advantages? Will the Axis nations dictate international trade policies? Will World War II last long enough for us to bring about complete independence through synthesis not only in rubber, but in fats and oils among other things? Will peace find the vast fatty oil-producing areas of the Far East greatly depreciated in value as the result of the work of the chemist, the physicist and the engineer? Will the story of natural indigo be repeated in Far Eastern fats and oils?

Your reporter reporting on world events and their relationship to fats and oils is still just a reporter—not a soothsayer nor a prophet.



Hydrogenation process. Crisco and Flakewhite rollers in operation.

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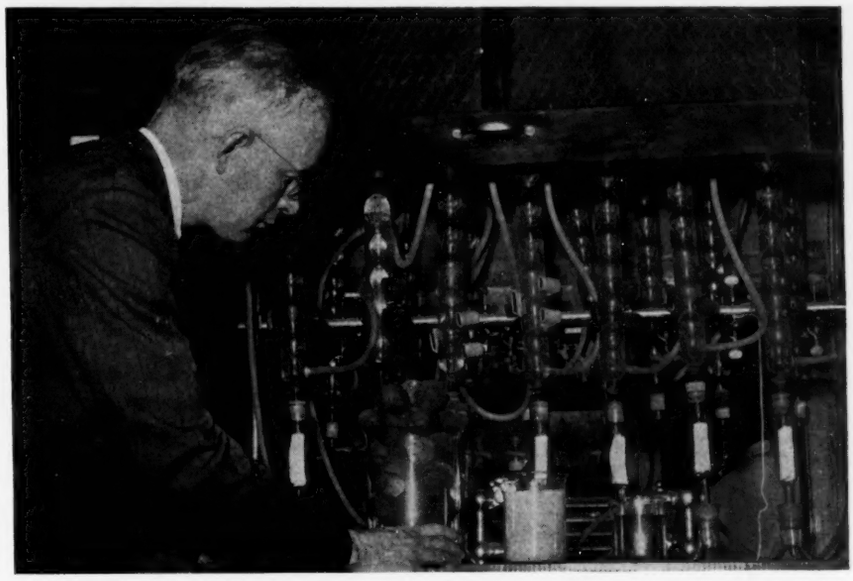

Equivalent amounts of tung fruit, tung meal and tung oil as produced at a tung oil mill, and the solvent extraction of tung oil. U.S.D.A. photograph.

BETWEEN THE LINES

Vitamins for Victory is another slogan we ought to play up these days. Their importance in winning this war is described in this article. We must supply vitamins to our armed forces and the Allied Nations to win this war.

THE letter "V" has assumed international significance as the "Victory" symbol, but as an adjunct to this victory, it is rapidly becoming associated also with Vitamins, those mysterious substances that came into public consciousness with the 1930's.

The association of vitamins with victory lies in the emphasis on supplies of these substances to the armed forces of the United States for various uses, first, and assurance of a continued supply to nations associated with the United States in winning the war. In the case of the latter group, vitamins are an essential not only for military use, but for maintaining civilian health in the face of curtailed supplies of normal foods.

In pill, pellet, bottle, and capsule, Vitamins A, B^1, C, D, E, and G, are valued for offsetting exhaustion, disease, and building up resistance. Abroad, during the German air blitz on England, there was considerable prominence given to use of Vitamin A for sharpening night vision in the RAF on bombing raids against Germany, and in night fights against the incoming Nazi bombers.

On this point, Navy Department experiments hint that there may be widespread public misconception, if not over-optimism. Admiral Ross T. McIntyre, chief of the Naval Medical Bureau, and incidentally, the official medical advisor of the White House, revealed to a House committee that his service has been going into the whole problem of night blindness, from cause to cure, and he said this:

"We have practically completed our studies on night blindness, so that we have 'debunked' already this vitamin proposition as the cause of night blindness. That has been done, but there has been nothing said about it."

Nevertheless, there was apparently considerable store set on the possibilities, and for whatever purpose vitamins were needed, the United States saw to it, that they were supplied. Under the terms of the Lend-Lease Act of April, 1941, the United States launched and maintained a steady flow of vitamins and food concentrates to accessible allied nations abroad, principally Great Britain.

Up to March 1, these shipments amounted to 90,563 pounds of Vitamin A, and 1,833 pounds of carotene, closely akin to the A vitamin, 4,710 pounds of Vitamin C, 2,886 pounds of Vitamin B^1, and 248,865 gallons of orange and lemon juice concentrates heavily impregnated with Vitamin C. Margarine used in England has been fortified with "A."

Many an undernourished British child or expectant mother, in that country, has thus benefited not only by American shipments, but American ingenuity, especially the latter. Incidentally, these shipments were made possible in part by stringent controls now in effect in this country, by War Production Board order.

Normally the United States imported 72,000,000 pounds of cod-liver oil, largely from Norway, and to some extent, from Japan. The occupation of Norway by the Nazis, and Pearl Harbor, effectively terminated, accordingly, a large part of the United States' source of its Vitamin A supply. The loss of Norway dates from over two years ago.

While the United States promptly turned to other, and hitherto undeveloped sources of this particular vitamin, to supplement remaining supplies, the continued availability of the vitamin was further assured for both essential public use here and for military use of our own troops, as well as civilian and military uses abroad, through WPB action.

This action took the form of curtailment of civilian consumption of fish liver oil Vitamin A, and initially, a reduction in use of this vitamin in feeds of various kinds. Subsequently the unrestricted use in feeds, of Vitamin A oils blended prior to February 10 was permitted.

Some features of this revised order included a prohibition, beginning April 10, of manufacture of any preparation containing more than 5,000 units of Vitamin A in the largest recommended adult daily dosage, but this did not apply where the Vitamin A potency was 25,000 units or more in the recommended dosage; the order prohibited, from April 10, manufacture of feeds containing more than 1,000 units of this vitamin of fish oil origin, except for certain feeding purposes. The latter exception was intended to stimulate egg and poultry production. The restriction applied tightly to all transactions in fish liver oils.

One aspect of the order was stated to be a stimulation of the shark-fishing industry. Actually, it already had been discovered that the so-called soup-fin shark, hitherto valued for reasons indicated by its name, was a gold-mine literally, for the lucky fisherman. The liver of this shark was stated to be more than 50 per cent oil, and this oil 30 times the Vitamin A potency factor of cod-liver oil, as well as higher in Vitamin A than almost any other fish oil.

The resulting jump in prices not only for whole sharks, but for their livers, from an initial 20 cents per pound up to $6.00 and $9.00 assured a boom industry in that capacity, at least. Long before this development, however, the chemical industry had been wrestling with the problem of vitamin supply, not only of Vitamin A, but the others.

Value Not Always Apparent

Some of these efforts had the aspect originally, of purely intellectual interest, as the value of the resulting synthetic products was not always apparent immediately. The development of a synthetic Vitamin C, for instance, appeared at an earlier stage, to be somewhat superfluous, in view of the known availability of this substance in citrus and other fruits.

The discovery of a check against scurvy at sea is a well-known story which is popularly blamed for the traditional nickname for British tars to this day, "Limey" and dates from the use in early-day wooden men-o-war, of citrus fruit juice, lemon or lime, as a preventive of this deficiency disease. Vitamin C, whether recognized under a name or not, thus had early recognition as a potent health factor.

Mention of the fact that by 1940 production of synthetic Vitamin C had risen to 17 tons annually leads to the realization that the extension of this development in the field of other vitamins also, has increased both the supply, and correspondingly lowered the price. The public that today accepts the availability of supplies of Vitamin B^1 for administering either by injection or dose internally, has little realization that this has been the case only for a short time, and that when the natural product became available first, in the mid-1930's, it cost $300 a gram, compared to the price of $0.53 per gram today, since the synthetic development of this substance in 1937.

A similar history of rising production by the chemical industry and proportionate lowering of prices, is shown for nicotinic acid, valued in fighting pellagra, Vitamin B^6, Vitamin B^2 or riboflavin, although the latter has not been produced in comparable quantities; and other substances in the vitamin class. In fact, the possibilities of such production, coupled with the extraordinary field of application at this time, is leading to a new industry, in effect.

In the case of Vitamin C, when it became commercially available in 1934, the price was about $213 per ounce, whereas today, synthetic Vitamin C is $1.65 per ounce.

(*Continued on page 834*)

NEW ALKYL PHOSPHORIC ACIDS

Suggest Varied Possibilities

THESE five alkyl phosphoric acids, now available in experimental quantities, have already attracted the interest of research and development men in several industries. Patents have been issued which indicate their value as catalysts and polymerizing agents in the manufacture of resins . . . as polymerizing agents in the processing of drying oils . . . and as water-insoluble, rust- and corrosion-proofing compounds. In addition, their metallic salts have also shown promise in several different fields.

While the raw materials situation makes supplying of commercial quantities uncertain at present, experimental quantities are available and samples will be sent on request. MONSANTO CHEMICAL COMPANY, Merrimac Division, Everett Station, Boston, Massachusetts.

ETHYL PHOSPHORIC ACID

1. **Specific gravity:** 1.33 at 25° C.
   Color: pale straw-colored liquid.
   Alkyl acid content: approximately 97%.

NORMAL BUTYL PHOSPHORIC ACID

2. **Specific gravity:** 1.24 at 25°C.
   Color: fluorescent reddish amber.
   Alkyl acid content: approximately 99%.

AMYL PHOSPHORIC ACID
(a pentasol derivative)

3. **Specific gravity:** 1.33 at 25° C.
   Color: fluorescent reddish amber.
   Alkyl acid content: approximately 99%.

METHYL PHOSPHORIC ACID

4. **Specific gravity:** 1.439 at 25° C.
   Color: pale straw-colored liquid.
   Alkyl acid content: approximately 97%.

NORMAL PROPYL PHOSPHORIC ACID

5. **Specific gravity:** 1.30 at 25° C.
   Color: reddish amber.
   Alkyl acid content: approximately 97%.

SUGGESTED USES

1. As catalysts in the manufacture of urea resins . . . Ind. Eng. Chem. 33 512-15 (1941).
2. As materials for forming water-insoluble coatings on metals for rust or corrosion prevention. U. S. Patent 2224695.
3. As polymerizing agents for drying oils, resins, etc., as outlined in U. S. Patent 2223548.
4. Metallic salts of these alkyl phosphoric acids show promise as flame-proofing compounds for fabrics and paper . . . as alternates for glycerin in vat printing pastes . . . and as fiber lubricants for wool spinning. Ind. Eng. Chem. 34 20-25 (1942).

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

MONSANTO CHEMICAL COMPANY, Everett Station, Boston, Mass.

Please send me samples of ☐ Methyl Phosphoric Acid ☐ Ethyl Phosphoric Acid ☐ Normal Propyl Phosphoric Acid ☐ Normal Butyl Phosphoric Acid ☐ Amyl Phosphoric Acid.

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*Firm*_____

*Address*_____ *City*_____

Chemical Engineers Meet in Bosto

THE 34th semi-annual meeting of the American Institute of Chemical Engineers was held in Boston May 11 to 13 with an attendance of 544 industry and government representatives. Highlight of the meeting was a war problems discussion held behind closed doors. Remainder of the meeting was devoted to presentation and discussion of technical papers.

On these pages CI presents a few shots taken by our roving photographer at the meeting.

(1) Speaking, E. Clifford Williams of General Mills, Inc., winner of the William H. Walker award. (2) James T. Power, Manager, Research Division, Atlas Powder, and William R. Collings, Chemical Engineer, Dow Chemical. (3) A. T. Eric Smith, Norman C. Hobson, Technical Sales Service, D. A. Pritchard, Technical Manager, Chemical Group, and H. R. L. Streight, Process Development Manager, all of Canadian Industries, Ltd., Montreal. (4) Dr. and Mrs. Joseph R. Minevitch. Dr. Minevitch is a chemical engineer with E. B. Badger & Sons Co., Boston. (5) A. P. Beardsley, Technical Advisor, Calco Chemical Division of Cyanamid, and N. A. Laury of the same company. (6) "Snapped at the Arnold Arboretum"—E. H. Schmidt, Chief Chemist, Borne Scrymser, A. M. Taylor, Consultant, Montclair, N. J., F. J. Van Antwerpen, Associate Editor, Industrial & Engineering Chemistry, and Donald F. Othmer, Head of the Chemical Engineering Department of Brooklyn "Poly." (7) J. Q. McGiffin, chemical engineer, Standard Oil Co. of Ohio. (8) J. H. Holden, McGill University, Montreal, Canada. (9) Albert J. Gerathy, Superintendent of Chemical Manufacturing of the Schering Corporation. (10) Alan S. Richards, Dewey & Almy, Cambridge, Mass.

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o Discuss Their Part in the War

(1) James W. Parker, Vice-President, Detroit Edison, and President of the American Society of Mechanical Engineers. (2) K. E. Bell, Technical Director, A. C. Laurence Leather Co., and Chairman of the local "Ichthyologists." (3) J. J. Healy, Jr., Chemical Engineer, Merrimac Division of Monsanto, and General Vice-Chairman of the meeting. (4) Hervey J. Skinner, President of Skinner & Sherman, Boston Consultants, and Treasurer of the Local Committee. (5) Clyde C. DeWitt, Head of the Chemical Engineering Department, Michigan State College, Lansing, Mich. (6) Left to right, James G. Vail, Director of Research, Philadelphia Quartz, who presented the Walker Award; Mrs. S. D. Kirkpatrick, wife of the President of the Institute; and Dr. Williams. (7) Raymond J. F. Kunz, Assistant Professor of Chemical Engineering, Cooper Union; and Chester L. Knowles, Chemical Sales Director of the Dorr Company, and Past Chairman of the N. Y. Section. (8) Adalbert Herman, Chief Chemist, Seagram & Calvert Distilleries and Herman F. Willkie of the same company. (9) J. V. N. Dorr, President of the Dorr Company; and John Traquair, Director of the Research Department of the Mead Corporation of Chillicothe, Ohio. (10) Mrs. Gustavus J. Esselen; Sidney D. Kirkpatrick, Editor of "Chem & Met," and President of the Institute; and Gustavus J. Esselen, Boston Consultant, and General Chairman. (i1) W. T. Hall, E. B. Badger & Sons Co.; Mark E. Putnam, Production Manager of Dow Chemical; and Erastus B. Badger, President of the Badger Company.

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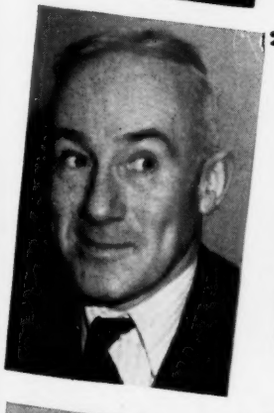

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Headliners in the News

William A. Roever, sales engineer since 1937 for Clark Bros. Co., Inc., was recently called to military service as adjutant on the Battalion Staff, A Battery, 31st Artillery Training Battalion. Lt. Roever was associated with both Dallas and Houston branch offices of Clark Bros.

R. W. Miller, who has been with Pittsburgh Plate Glass Co. for the past 12 years, has been appointed manager of the technical service department of the company's Columbia Chemical Division. He succeeds Dr. G. L. Cunningham who has resigned.

Dr. John L. Oncley, associate in physical chemistry at the Harvard Medical School, has been awarded the $1,000 American Chemical Society Prize in Pure Chemistry for 1942. Also instructor in chemistry at M. I. T., he is cited for outstanding research in protein chemistry.

John S. McAbee, divisional sales manager in charge of sales of bulk chemicals for J. T. Baker Chemical Co., joined the Naval Reserve last month as a Lieutenant Junior Grade. He had been with Baker for the past 10 years.

J. R. Brenemen has been appointed West Coast representative for Gelatin Products Co., Detroit. He was formerly sales promotion manager for Nelson Baker & Co.

SEND FOR THIS

Laboratory Research Data Sheet

Name .....

Address .....

City..... State.....

We earnestly solicit your cooperation in regard to the information requested below. Activated Carbons are notoriously selective in their action, making it frequently very difficult to recommend in advance the quality, or method of treatment that will insure maximum benefit to the prospective user. Submittal of this Data Sheet is solely for the purpose of intelligent cooperation:

1. Product to be treated and approximate annual tonnage.....
2. Do you seek improvement in (a) color ☐ (b) Flavor ☐ (c) Odor ☐
3. What standards, if any, do you have for the following properties in your final product?
   (a) color .....
   (b) flavor .....
   (d) pH .....
   (e) ash .....

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2. **The right temperature can have considerable bearing on the securing of the maximum results.**

3. **The correct pH for carbon and product is also of great importance.**

These Laboratory Data Sheets are designed for your convenience. Let us send a set to you to be filled out and forwarded to our Research Department, whose services are available to you for consultation without obligation or expense.

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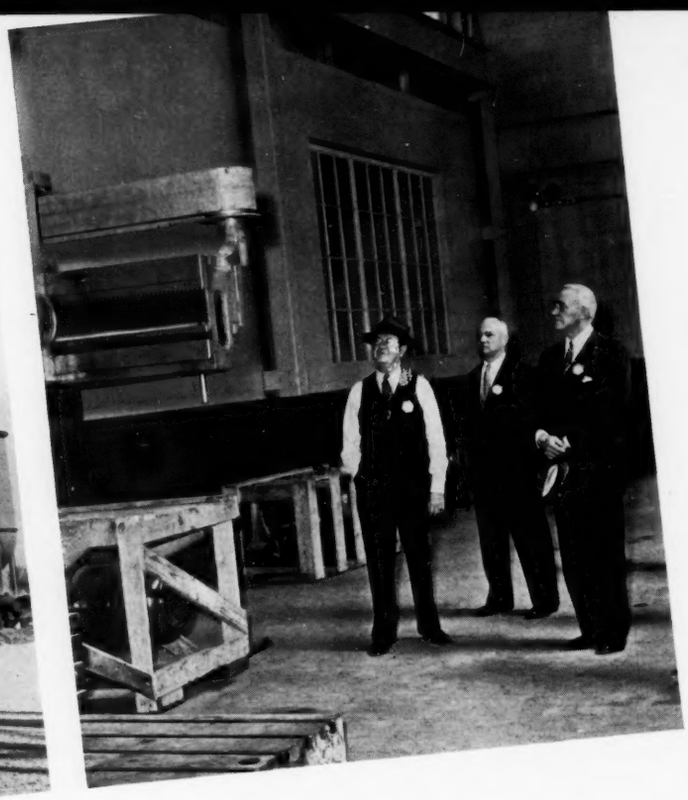

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What's New in the Chemical Industry

(1, 2, 3, 4) These photos were taken at the recent opening of Monsanto Chemical Co.'s new Phosphate Division Plant at Trenton, Mich. (1) R. R. Cole, vice-president and general manager of the Phosphate Division; Earl A. Tomes, Detroit sales representative; and Charles Belknap, executive vice-president of the company. (2) Belknap with Felix N. Williams, production manager; Cole and Tomes. (3) Exterior view of the new manufacturing plant. (4) View from closer angle.

(5) Jeffrey Manufacturing Co., Columbus, O., was awarded the Navy "E" for work "WELL DONE" last month. Photo shows O. R. Ehret, oldest Jeffrey employee, receiving Navy "E" button from Commander G. H. Bowman, U.S.N. (Ret.)

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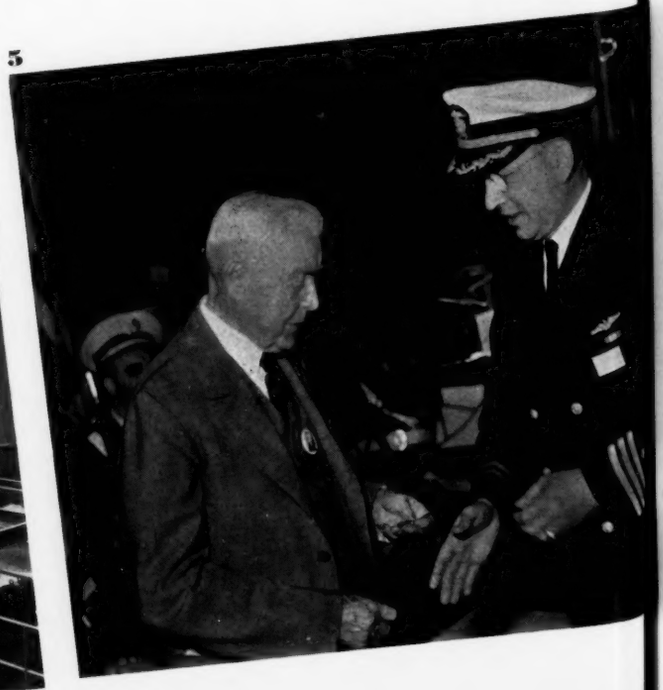

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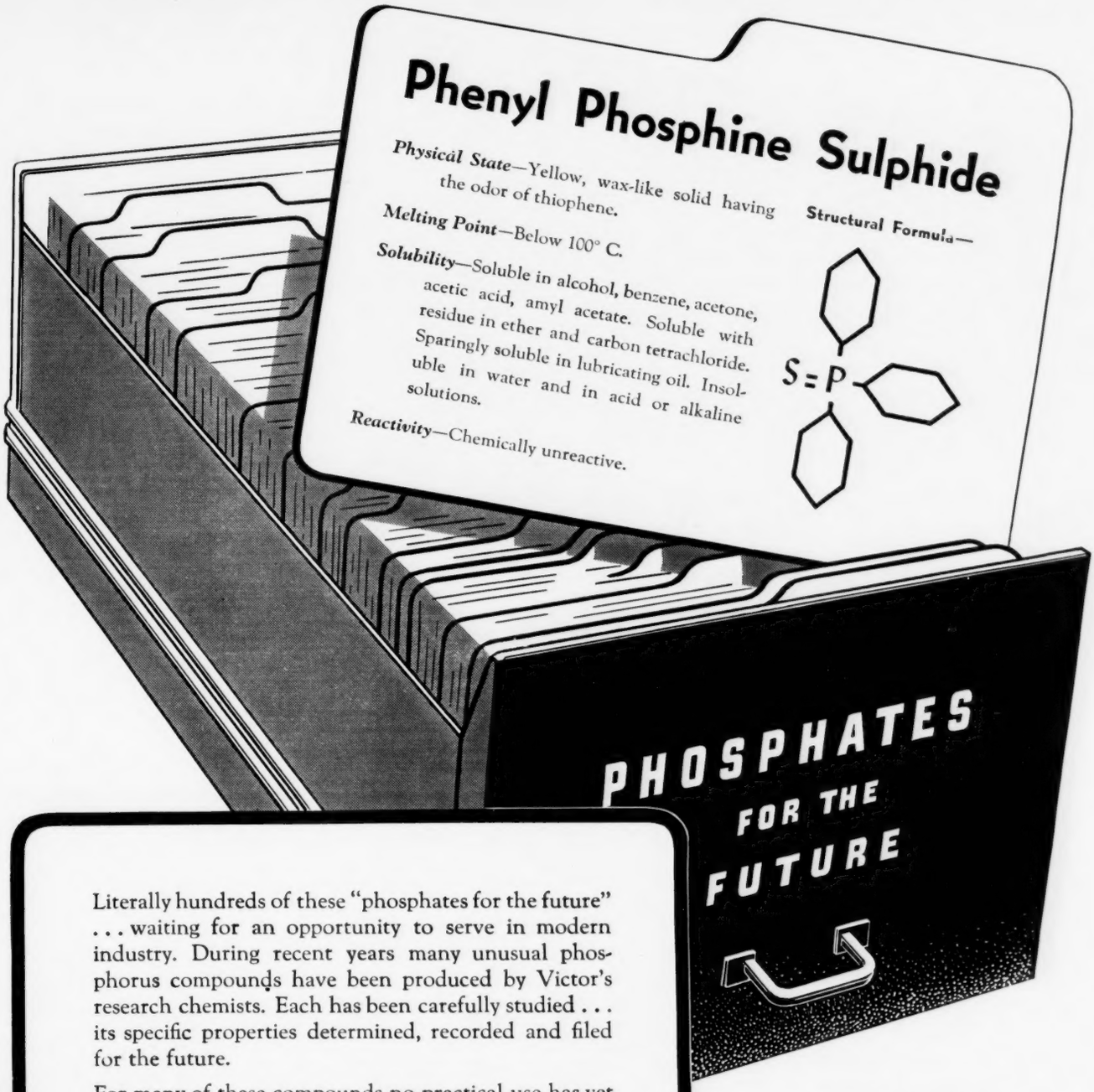
Phenyl Phosphine Sulphide
Physical State—Yellow, wax-like solid having the odor of thiophene.
Melting Point—Below 100° C.
Solubility—Soluble in alcohol, benzene, acetone, acetic acid, amyl acetate. Soluble with residue in ether and carbon tetrachloride. Sparingly soluble in lubricating oil. Insoluble in water and in acid or alkaline solutions.
Reactivity—Chemically unreactive.
Structural Formula—
S=P
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FOR THE
FUTURE

Literally hundreds of these "phosphates for the future" . . . waiting for an opportunity to serve in modern industry. During recent years many unusual phosphorus compounds have been produced by Victor's research chemists. Each has been carefully studied . . . its specific properties determined, recorded and filed for the future.

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- Phosphorus Oxychloride
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- Alkyl Ammonium Phosphates
- Fireproofing Compounds
- Calcium Phosphates
- Magnesium Phosphates
- Potassium Phosphates
- Sodium Phosphates
- Sodium Pyrophosphates
- Potassium Pyrophosphate
- Alkyl Acid Pyrophosphates
- Formic Acid
- Aluminum Formate
- Sodium Formate
- Sodium Boroformate
- Oxalic Acid
- Calcium Oxalate
- Sodium Oxalate
- Magnesium Sulphate
- Sodium Aluminum Sulphate
- Ferrophosphorus

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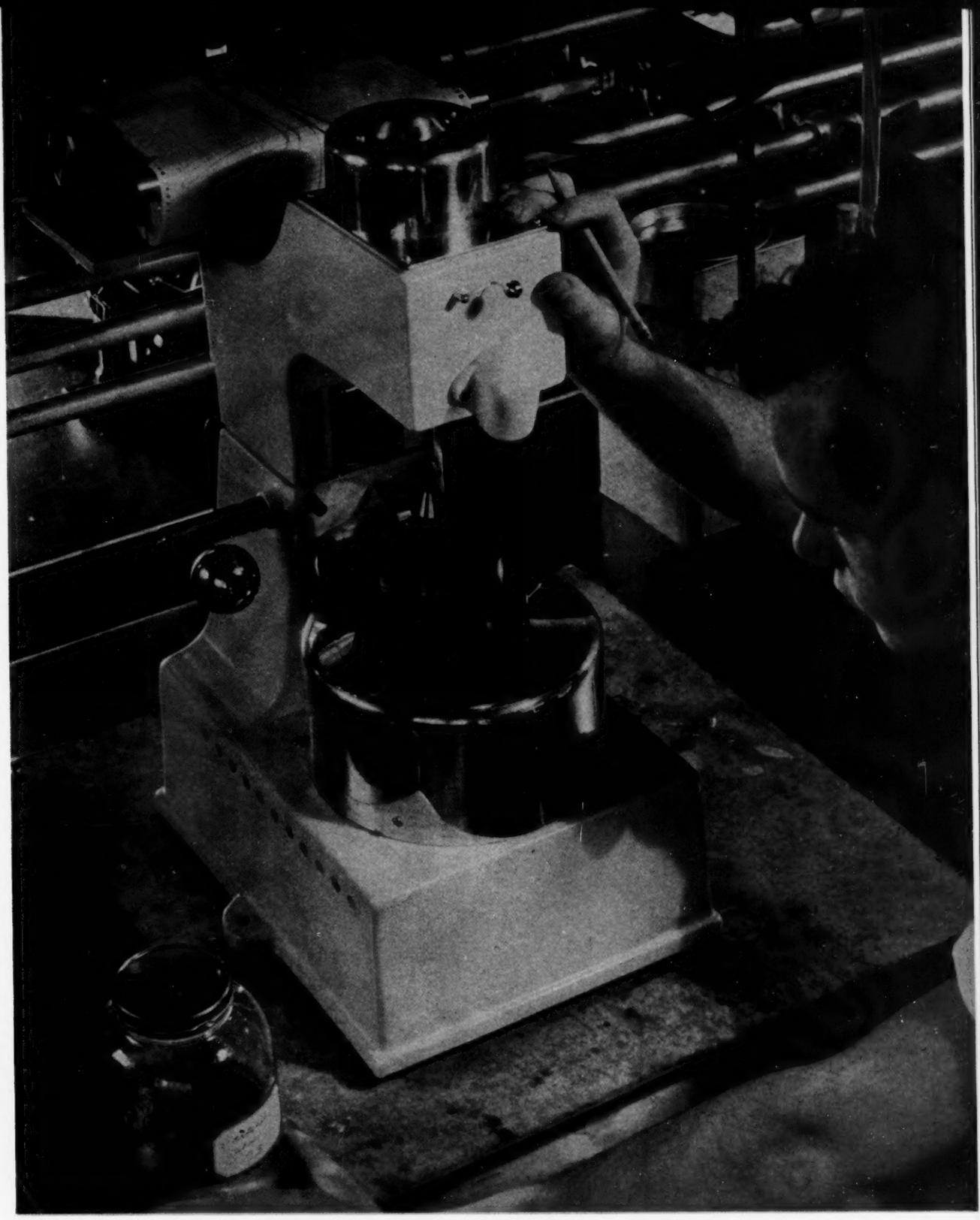
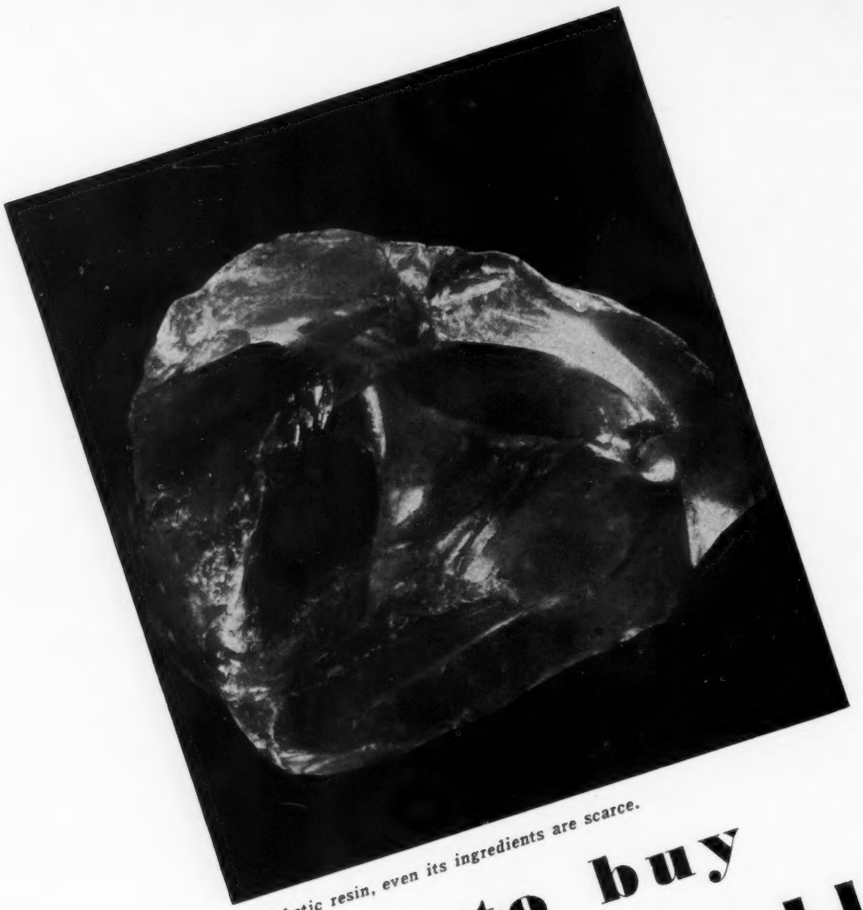


NEW CHEMICALS FOR INDUSTRY

Conversion of starch with enzymes is becoming increasingly important. Rohm & Haas laboratories use Brachender Viscosimeter to evaluate accurately their enzymatic products, the diastases. This machine automatically determines and records the viscosity of the starch-enzyme mix while its temperature changes.

Digest of Chemical Developments in Converting and Processing Fields



Synthetic resin, even its ingredients are scarce.

how to buy SUBSTITUTES

By E. Rosendahl, *Glyco Products Co., Inc.*

In these times it is imperative for manufacturers to have two or three substitutes to replace materials in the event such materials are no longer available. That's a tough job today. Here is some pertinent information on the subject from a man who has had considerable experience in this field. Perhaps your answer is here.

SEVERAL years ago the author wrote an article* in which he suggested that manufacturers might consider the possibilities of alternative materials for products which undoubtedly would become scarce or completely unavailable if the then European War was to become more extensive in scope. Since that time, not only the United States, but many other countries have become active belligerents. It is now far easier to compile a list of available raw materials, than products which have been cut off due to priorities, supplying countries being occupied by enemy forces, etc.

* "Replacement or Substitute," Chemical Industries—April, 1940.

Not only have we been forced to use substitutes for many of our basic products, but substitutes for the substitutes we formerly disdained. And as time goes on, the list is certain to be extended, practically indefinitely. The consequent disruption to our economic life has become apparent to every manufacturer and in every industry. It is, therefore, imperative for manufacturers to have at least one and advisably two or three products which can replace materials in the event such materials are no longer available. In endeavoring to obtain substitutes for experimental work it is necessary to know the particular properties of the original material which are essential in the manufacture of the finished product.

Not as Easy as it Sounds

This is not quite as easy as it sounds. Materials have been used in formulation and compounding for years, the original reason for using them being unknown or lost in antiquity. Right here it might be mentioned that no substitute can be expected to replace the original material in all the properties the original material possesses. Fortunately, it is very seldom that all these properties are required at one and the same time in any one particular formulation. If all the desirable or essential properties are known, the first part of the battle has been won. Thus for instance, if you are manufacturing an anti-freeze from glycerine and are looking for a glycerine substitute, you require a fluid product with a low freezing point. It must be completely water soluble and non-corrosive. Furthermore, its boiling point should not be too low, no lower than alcohol in any case. There are other desirable but not absolutely essential properties, such as lightness of color and freedom from odor. However, the manufacturer of anti-freeze liquids does not care if the substitute product is as sweet as glycerine, or has the same bodying action. His interest in its hygroscopicity is nil, provided of course, it does not dry out when put into the radiator. The fact that glycerine reacts with rosin to form ester gum, whereas the substitute product does not, has no significance to him in any way.

If, however, the necessary properties are not evident in the surface, a second method of attack must be utilized.

The various properties of the original material should be obtained from the manufacturer or any good chemical handbook or dictionary. These should be listed as completely as possible and checked against your ideas of your own particular requirements. Falling back on glycerine again as an example, let us try and list the physical properties categorically, insofar as they may be called on in industry. We can only consider the major properties, and even then perhaps to a limited extent.

Form
Viscosity
Color
Odor
Freezing Point
pH
Solubility in Water
Solubility in Alcohol
Solubility in Oils
Solubility in Solvents
Toxicity
Taste
Solvency for other products
Hygroscopicity
Boiling Point
Resistance to Acids
Resistance to Alkalies

It is evident from the above list that only a few properties may be of interest in any one particular formula. On the other hand, for special uses, other properties may be necessary. Thus, in the cosmetic industry, an important factor is that the substitute product should not harm the skin in any way. Furthermore, it should have an emollient or softening action on the skin. These properties are applicable to glycerine and probably a good many other products. On the other hand, there are properties required for other products which are not included. Thus, in looking for a substitute for dibutyl phthalate, as a plasticizer for nitro cellulose lacquers, the first and most important requirement is that it should be compatible with nitrocellulose. Then it must be soluble in the usual lacquer solvents and thinners. It must have low acidity and so on.

With a list of this type, the manufacturer can immediately eliminate a number of properties in which he has no interest. He can then approach the manufacturer of substitutes with something concrete. He can state, for instance, that he is looking for a substitute for glycerine with certain definite properties. If the supplier has a number of products which he recommends to replace glycerine, he can, with the customer's requirements in front of him, immediately rule out certain substitutes, while suggesting others for the purpose. It must, however, be remembered that any material suggested must of necessity be tried in an experimental way, in order to determine its possibilities. A product may, on the surface have all the properties desired and yet, when tried experimentally fail for reasons which were not apparent originally. Even this failure, however, may not be fatal. If, of course, the failure is due to chemical reaction between the substitute and one or more of the other materials used in the formula, then another substitute would have to be tried. Although, in certain cases which have come to the author's attention, the formula itself has been modified and built around the new material with considerable success. On the other hand, if the failure is physical—the finished product is too sticky or not sticky enough, too hard or not hard enough,—a change in quantities used or even procedure may overcome the difficulty very easily. Naturally, work has to be done, and that must be recognized at the very beginning. It must not be forgotten that before the original formula was developed, much experimental work had to be completed in most cases. Changes had to be made not only in formulation, but in manufacturing procedure before production could be put on a sound basis. It is, therefore, self-evident that similar if not as intensive work might have to be done in order to utilize the new material in the way desired and for the purpose intended.

Price Not too Important

So far we have not even mentioned price in this article, because price may not play as important a part as might at first seem necessary. On the face of it, it might be considered absurd to suggest a replacement which is much more expensive than the original material. When the company with which the author is connected, developed a material which seemed to possess many of the properties of the material it was desired to replace, it was found that it would have to be sold at a price a little more than double that of the original product. It was, therefore, simply marked, "interesting but too expensive" and shelved. A little while later we were asked for a substitute having the very properties possessed by this new material, and by no other substitute which we had to offer. It was, therefore, suggested very tentatively and somewhat hesitantly. Samples were submitted and in a short while, the customer reported that not only was it a perfect substitute for their purpose, but that the amounts necessary were smaller than those of the original material, and therefore, the price differential was practically unimportant. Furthermore, it imparted properties to their product which they had never been able to obtain with the previous material used.

As a matter of fact, this latter discovery is not particularly unique. Many manufacturers are finding that substitutes are giving them results definitely superior to those previously obtained, and it is not too much to claim that after the war, many products which were formerly deemed indispensable for certain purposes will be completely ignored even when their availability is assured.

In attempting to find substitutes, it is suggested that responsible manufacturers of substitutes be consulted. Give them as much information as you possibly can, they'll treat the disclosures as confidential. It is only by giving them this information that you will enable them to give you the help you desire.

Industry's Bookshelf

An Introduction to Electrochemistry by Samuel Glasstone, D. Von Nostrand Company, Inc., 557 p., $5.00.

The fundamental principles of electrochemistry play vital roles in many branches of chemistry and other sciences as well as chemical and electrical engineering.

In this book the author, who is professor of chemistry at the University of Oklahoma, clearly explains the science from the standpoint of current ideas and theories. In his conception electrochemistry is based on four great developments of recent years, namely; the activity concept, the interionic attraction theory, the proton-transfer theory of acids and bases, and the treatment of electrode reactions as rate processes.

Introduction to Semimicro Qualitative Chemical Analysis, by Louis J. Curtman, The Macmillan Company, 377 p., $2.75.

This volume on semimicro qualitative analysis is the result of experimental research work carried out by the author over the past two years, during which time a practical course in qualitative analysis using small quantities of sample and reagents was worked out at the College of the City of New York.

Because the aim of the book is to coordinate theory and laboratory work for the purpose of providing a sound scientific foundation for the prospective student of chemistry, medicine, dentistry and engineering, there are only a few organic reagents employed in the procedures. The author believes it is unsound to introduce a large number of such reagents into a semimicro course, since the average student in qualitative analysis does not possess sufficient knowledge of organic chemistry to understand the complex reactions.

Considerable emphasis is placed on proper laboratory technique which is illustrated by numerous diagrams and photographs.

Outlines of Food Technology by Harry W. von Loesecke, Reinhold Publishing Corp., 504 p., $7.00.

This is a timely book because, although food is always of interest to us, nutrition becomes especially important in time of war.

Important changes are being made in the industry, conspicuous among which are the substitution of other containers for tin cans, the creation of a new industry in dehydrated foods and the widespread use of vitamins.

This book is well suited as a source of understanding of a timely subject. Its purpose is to outline the processes used in the modern food industry, but no attempt has been made to give details on preparation of food products.

Individual chapters are devoted to the container situation and to the technique of quick-freezing.

The text is accompanied by tables of chemical compositions of foods and by photographs and drawings. At the end of each chapter the author supplies a bibliography of suggested readings.

FOREIGN LITERATURE DIGEST

By T. E. R. Singer

BOLETIM DO CONSELHO FEDERAL DE COMERCIO EXTERIOR, Vol. 5, No. 5, Feb 2, 1942, p. 12-16.

A comprehensive and detailed table is given on the Brazilian production of vegetable oils and fats for the period 1935-40 by years, states, and product, including information on quantities and values. Such fats and oils as Babacu, cotton seed, castor, oiticica, cocoa, palm, linseed and many others are included.

BOLETIM DO CONSELHO FEDERAL DE COMERCIO EXTERIOR, Vol. 5, No. 3, Jan. 19, 1942, p. 5.

An interesting note appears on the production and trade of caffeine in Brazil. Official information reveals at present the following producers of caffeine by extraction from "Paraguay tea" (or "mate"): 1) Industrias Reunidas Jaragua S. A., Santa Catarina, with a daily capacity of 10 kilograms; 2) Sociedade Intercambio Mercantil Argentino Brasileiro SIMAB, Sao Paulo, with a daily capacity of 60 kilograms; and finally the Cia. Alves de Produtos Quimicos Ltda., Santa Catarina, now being installed.

BOLETIN DE MINAS Y PETROLEO (Mexico) Vol. XIII, No. 3, (1941) p. 22-4.

The Federal Loan Agency of the United States of America is to buy the exportable surplus metals of Mexico. The letters exchanged between Walter Douglas, representative of the United States, and Luciano Weichers, representative of the Mexican government, which state the terms of the agreement, are reprinted.

P. 64-66.

Plugging oil wells. Before petroleum laws were established in Mexico, numerous non-producing oil wells were left open, which frequently resulted in the escape of salt water, gas, oil-water or gas-water emulsions with considerable damage to the surrounding country. A specific example is given for one oil well 2,584 meters deep. Various methods are discussed using cement, thick mud, etc., as the case may demand.

BOLETIM DO CONSELHO FEDERAL DE COMERCIO EXTERIOR, Vol. IV, No. 42, p. 8-9, Rio de Janeiro, (1941).

A table appears in this issue of the Boletim, giving statistics on the exportation of the principal mineral products of Brazil for 1940 and 1941. Some of these are as follows:

Type of Product	Kilograms 1940 (12 mos.)	1941 (8 mos.)	Countries Exported to Percentage of value of 1941 (January to August)
Asbestos	2,940	2,000	United States, 100%
Kaolin	196,950	563,978	Argentine, 93.7%; Chile, 3.9%; Uruguay, 2.4%
Quartz or rock crystal	1,103,021	1,176,696	United States, 42.4%; Japan, 23.9%; Great Britain, 27.9%; Germany, 4.8%; Others, 1%
Beryl	1,472,067	1,012,291	United States, 48.8%; Germany, 45.9%; Others, 5.3%
Mica	1,117,474	565,475	Japan, 48.9%; United States, 27.4%; Germany, 11.9%; Others, 11.8%
Diamonds	50,648 gr.	40,627 gr.	United States, 58.6%; Japan, 32.3%; Italy, 4.4%; Switzerland, 3.4%; Others, 1.3%
Tourmaline	130,017 gr.	23,976 gr.	Germany, 50.1%; United States, 44.6%; Others, 5.3%
Bauxite	82,020	2,747,980	United States, 86.8%; Uruguay, 11.8%; Argentine, 1.4%
Chromium (mineral)	4,572,000	2,092,960	United States, 100%
Iron (mineral)	255,548,000	245,141,000	Great Britain, 60.9%; United States, 29.2%; Canada, 9.9%
Manganese (mineral)	222,713,000	250,123,000	United States, 94.6%; Japan, 5.4%
Ilmenite	12,190	2,620,924	United States, 100%
Rutile	498,589	1,035,866	United States, 49.9%; Germany, 29.7%; Great Britain, 20.4%
Zirconium	1,520,829	4,366,241	United States, 92.7%; Germany, 6%; Japan, 1.3%
Tantalite	27,117	48,710	United States, 57.7%; Japan, 42.3%

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NEW PRODUCTS AND PROCESSES

By James M. Crowe

A corrosion-inhibiting additive for clear lacquers, nitrocellulose solutions, and alcoholic shellacs which eliminates the need for shipping these materials in tin-lined drums, has been announced by the Merrimac Division of Monsanto Chemical Company.

The additive is a solution of an organo-phosphorus compound and is known as D. P. Solution. Used in lacquers in proportions of 0.1 to 1.0 per cent, it has been found to give effective protection against corrosion of iron or steel under conditions met in the handling of lacquer shipments.

Its action is ascribed to the fact that it reacts with iron to form an insoluble film. Though of but microscopic thickness, this film is sufficient to afford protection to the surface and in case of breaks it is self-mending by virtue of the very manner in which it is formed.

Relative to the problem of lacquer corrosion, Dr. G. R. Barrett, responsible for the development, says the following:

"The tendency for water white lacquer solutions and nitrocellulose solutions to discolor on standing in steel containers is well-known. This discoloration is due to the formation of colored iron salts caused by the attack on the steel drum of acids developed by the hydrolysis of the solvents used.

"As it is impractical always to use anhydrous solvents, the common way of overcoming this difficulty has been to ship or store materials in tin-lined drums. These drums are costly and furthermore at the present time tin is not easy to secure. The addition of D. P. Solution to the lacquer or nitrocellulose solution seems effectively to prevent corrosion and consequent discoloration when storage is in ordinary steel. The small percentage required has a negligible effect on other properties of the lacquers.

"The minimum amount of active constituent should be not less than 0.75 per cent on the weight of the nitrocellulose. The amount required depends upon the corrosive tendencies of the lacquer and the concentration of nitrocellulose. In general, lacquers containing acid resins require more than when neutral resins are used. Highly concentrated solutions of low viscosity nitrocellulose require more additive than dilute solutions or solutions of higher viscosity nitrocellulose. Most corrosion starts at the liquid vapor line and once started progresses rapidly. It is advisable where drums are used for storage to invert them for a short time before leaving them in a given position for a long time. This permits a coating to form over the entire interior of the container."

Mr. John J. Healy, Jr., director of development, Merrimac Division, stated further that D. P. Solution is not recommended for pigmented lacquers inasmuch as pigments absorb it from solution and render it ineffective. Neither is it recommended for use in paints or synthetics which dry by oxidation, as it will precipitate the driers.

In addition to inhibiting corrosion, D. P. Solution has demonstrated interesting properties as a flocculating agent for maintaining good suspensions of the flatting agent in flat lacquers. The majority of lacquers contain sufficient flocculating agent introduced through the solvents, nitrocellulose or flatting agent itself, to prevent settling, but it has been found that this condition is assured in almost any lacquer when D. P. Solution is used.

New Water Paint

Sherwin-Williams' chemists have developed a new oil-less interior wall finish. The new product, called Kem-Tone uses water as a thinner, but is not an ordinary water paint. It is said to be a new product made possible by recent development in the field of synthetic resins and employing completely new scientific principles. Whereas many paints use oxidizing oils and solvents to form a vehicle for the pigment, the Kem-Tone vehicle consists of a water and synthetic resin emulsion.

When applied to a wall, two separate processes occur. The first, which takes about an hour, is evaporation of the water, which leaves the surface dry to touch. This is followed by polymerization in which the actual character of the resin undergoes a change resulting in a tough, waterproof surface that is washable. This "curing" action takes about forty-eight hours.

Because of the principles involved, Kem-Tone is believed to have a large scope of usefulness. The company claims it can be applied directly over practically any type of surface except kalsomine without priming. It has the ability to cover wallpapered surfaces without removing the paper. It is also claimed that the new finish may be applied to new plaster walls without any priming or sizing coat and without waiting for the plaster to dry thoroughly.

Other surfaces which may be covered without previous preparation include brick, stucco, and cement walls, wall and plaster board, oil painted surfaces and casein painted surfaces.

Cellulose Acetate Fiber Process

The Celanese Corporation of America has recently patented a refinement in the process of making staple fibers of cellulose acetate for the manufacture of fluffy or napped fabrics, either woven or knitted, which do not readily shed the individual fibers.

According to the process of the patent, staple fibers are firmly anchored in the body of yarns by having one or more finished relatively fine threads or yarns, carrying a solvent or softening agent for cellulose acetate associated with the cellulose acetate staple fibers while they are being spun, and then twisting the composite yarn so that the fine thread becomes embedded in the structure of the spun yarns.

The solvent in the fine thread causes the cellulose acetate fibers to soften or partially dissolve and, upon evaporation of the solvent, the fibers remain firmly attached to the fine thread.

New Resins

A new resin called Aroplaz 1323 has been developed by Stroock and Wittenberg Corporation. It is a pure oxidizing alkyd of medium oil length which has been developed to serve as an improved vehicle for all the classifications of Holabird Quartermaster Depot Specification HDQ-ES-680. Specifications for the new resin are as follows: Acid, Solid Resin 5-10. Color, 50% Solution; 5-12(G-H 1933). Viscosity, 50% Solution; Z1—Z3(G-H). Weight per Gallon at 20°C.; 7.7 lbs. Compatibility; Excellent with coal-tar hydrocarbons, lacquer solvents and plasticizers, good with oils, varnishes, and petroleum hydrocarbons; insoluble in ethyl alcohol.

Essential Oil Solvent

A non-alcoholic, water-soluble solvent for essential oils has recently been introduced by the Glyco Products Co., Inc., known as Solvent S-533. The company claims it will dissolve essential oils, giving clear solutions which can be diluted in all proportions with water without affecting the clarity of the finished product. Alcohol can also be added in small quantities if desired. Solvent S-533 is light in color and free from objectionable odors. It is readily available in commercial quantities. It is recommended by the manufacturers for toilet waters, non-alcoholic perfumes, after-shave lotions, theatre sprays, etc.

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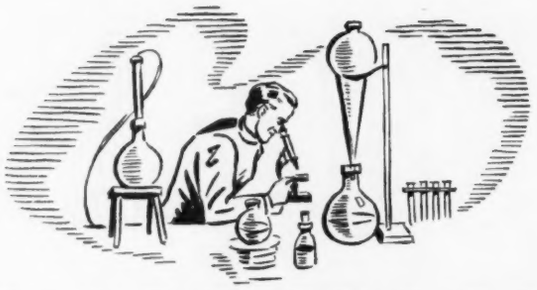
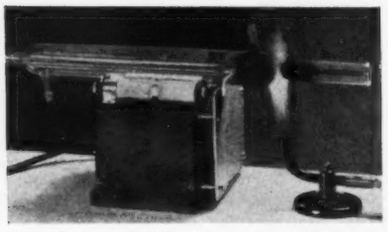


THE LABORATORY NOTEBOOK

Glass Blowers Aid

Many laboratories find it necessary and convenient to construct special glass apparatus and to repair or salvage broken equipment. In many cases improved tools go a long way toward helping the unprofessional glass blower turn out a good job.

In this connection a recent development has been put on the market by the Fisher Scientific Co. The new apparatus, called Fisher Glass Blowers' Rollers, was first developed for use by skilled glass blowers in the shops of the Fisher Scientific Co. and Eimer & Amend. It proved so useful in their work that the company is putting the product on the market with the belief that even those who do only a little glass shaping will find it a valuable addition to their equipment and that it will be more essential for those who do considerable glass work.



The unit as illustrated here is a self-contained, electrically operated apparatus upon which glass tubing and other cylindrical objects are held and rotated while being heated. It is particularly useful for pre-heating or annealing operations and whenever glass is to be heated evenly and uniformly.

The apparatus includes two adjacent rollers four inches long and one inch in diameter. These rollers have a knurled surface and are rotated in a horizontal position at the rate of approximately one revolution per second. The rollers are mounted on a sturdy metal stand which encloses the motor and gear system which turns the rollers. When the apparatus is plugged into any 110 volt, 50/60 cycle A.C. line, the rollers operate without attention, thus enabling the laboratorian to proceed with other work.

In making a glass ring seal, such as in a condenser, it is quite important that the joint be annealed to remove strains. Annealing is accomplished by keeping the glass at an elevated temperature for a period of time. The heat must be applied evenly and uniformly in order to prevent the glass from reaching the flow state at any point and to effect thorough annealing.

The rollers serve much better than the manual method of turning the glass in a flame to anneal it, and, of course, can be employed where a large annealing oven is not available. All that is required is to place the glass piece on the rollers so that the part to be annealed is revolved over a Bunsen type burner.

A feature of the unit is the protective shield which prevents overheating of the apparatus by the annealing flame. On the face of the support there is a transite plate which effectively insulates the motor and other parts of the apparatus.

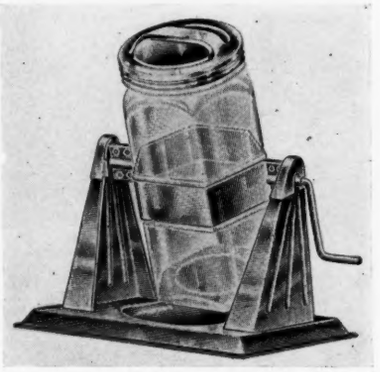
Blackout Bulb Unit

Important changes in blackout bulb specifications are announced by the Wabash Appliance Corporation, whose silver-lined blackout bulb placed on the market in early January has been put through extensive blackout tests. Specification changes are based on the results of these tests, as well as on various official recommendations.

The most important specification change is in color of light from blue and red to the deep orange recommended by the Office of Civilian Defense. Other changes are in size which is smaller, in reduced current consumption to 15 watts, in elimination of the former built-in reflector, and in the improved type of heavy black silicate coating to prevent light leakage.

Mixer

A new laboratory mixing device called the Tumbling Jar has been put out by the American Technical Corporation. According to the manufacturer it is excellent for mixing, blending, and dispersing of liquids or powders.



The jar is made of heavy molded glass and has a gallon and a half capacity with a five and one-half inch diameter screw top to admit many sizes and styles of bottles, vials, capsules, or metal sample containers. It is mounted on a rigid steel support which is cadmium plated for corrosion resistance. The jar is easily removable from the base and the entire unit can be readily converted to a motor drive.

Protective Clothing

The Safety Clothing and Equipment Co. is now featuring neoprene coated clothing for protection against heat, sparks, chemicals, etc.

The company has just issued a folder illustrating and describing a line of clothing including jumper suits, coats, pants, overalls, gloves, aprons, sleeves, etc.

PLANT OPERATION AND MANAGEMENT

Increased need for aluminum and magnesium has doubled the manufacture of Westinghouse Ignitrons because of their use in these electro-chemical processes. (They convert alternating into direct current.) Dr. Joseph Slepian and W. E. Pakala of Westinghouse are shown as they inspect the vacuum gauge of an Ignitron rectifier. Technology is at work!

Digest of New Methods and Equipment for Chemical Makers

Maintenance of Motors IN THE CHEMICAL INDUSTRY

By W. W. McCollough and H. E. Dralle

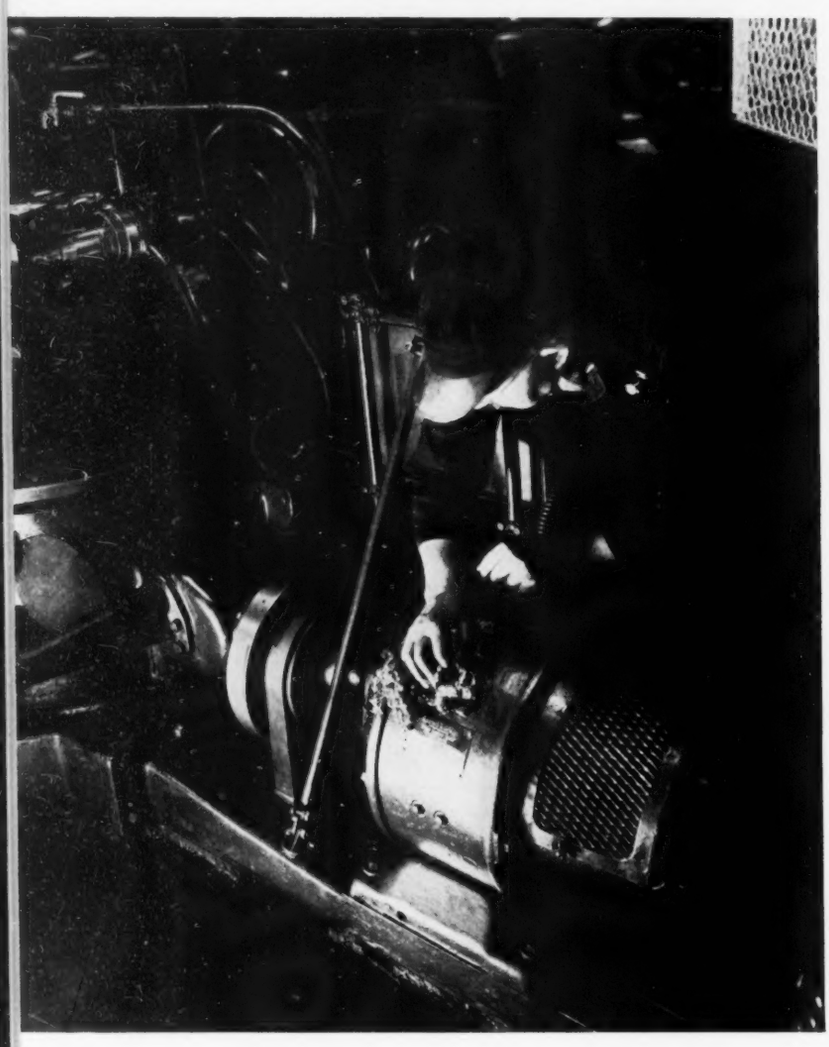
Westinghouse Electric & Manufacturing Company

More perhaps than any other industry, the chemical industry has one of its toughest problems in the maintenance of its electric motors. This is a particularly comprehensive article by two authorities in the field on what to do about your motors and how to do it. It should give you a solution to your problem and an insight into the type of care this equipment demands.

IN almost every phase of the chemical industry, the presence of gases, dusts, and liquids injurious to insulation and mechanical parts of motors necessitates unusual construction details to insure long operating life and reasonable maintenance in electric motors. Regardless of the type of mechanical construction used, it is almost impossible to prevent injurious gases from coming into contact with the motor windings. For that reason, special insulations that are resistant to the attack of injurious gases must be a part of all new motors, and to minimize shutdowns a well-organized maintenance program must be carried out through the life of the motors.

Not only is motor insulation vulnerable to attack in chemical plants, the frames, conduit boxes, fans, and other mechanical parts must all be designed to meet unusual requirements. It is well known that steel is susceptible to attack by acids and caustics; therefore, to minimize deterioration motor frames and conduit boxes are best made of cast iron, and fans are of either malleable iron or bronze specially

Periodic cleaning prevents dust and dirt from getting into motor windings. How does your plant do this?



Two h. p., 440 volt, 3 phase, 60 cycle, splash proof, squirrel cage induction motor driving into a concentrating table in a large chemical plant.

Below, 440 v., 3-phase, 60 cycle, splash proof, squirrel cage induction motors driving evaporator pumps in a large chlorine plant. Note clean appearance.

treated with shellacs to resist attack from liquids, dust, and injurious gases.

Of the many types of alternating current motors—open, splash proof, drip proof, totally enclosed, totally enclosed fan cooled—available for use in the chemical industry, the totally enclosed, fan cooled type is the easy choice of operating men. This is not surprising when one thoughtfully considers the construction from which this type of motor derives its name.

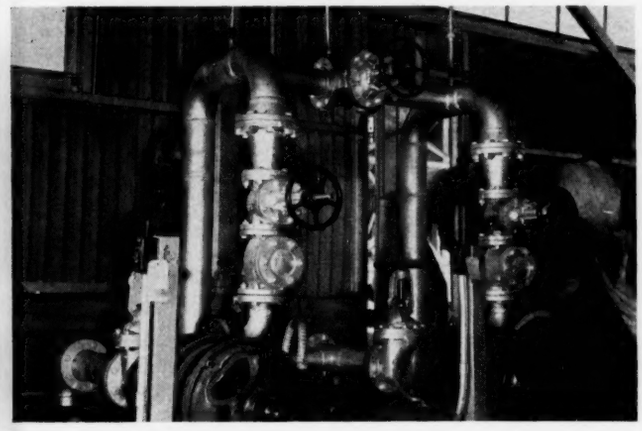
Totally enclosed fan cooled motors are sealed to exclude abrasive dusts, metallic particles, splashing liquids, and injurious gases from coming into direct contact with the insulation and thereby shortening its life. It has been pointed out that special design and construction alone minimize but do not eliminate the necessity for motor care and maintenance.

In the maintenance of these enclosed type motors, there are several practical considerations that should be followed.

(1) *Keep the frame fits tight.* If the motor is dismantled for any reason, care must be taken to see that abutting joints in frame and brackets are tight. A water resistant grease used in the fits will aid in preventing entry of dust, gases, and liquids to the motor.

(2) *Keep the inside of the motor dry.* Drain any accumulated water from the bottom of the motor before it can cause trouble. On all orders for new Totally Enclosed Fan Cooled motors except those for Class I group D locations, drain holes in the bottom of the frame should be specified where moisture conditions are severe. Motor mountings should be made to provide access to this drain plug.

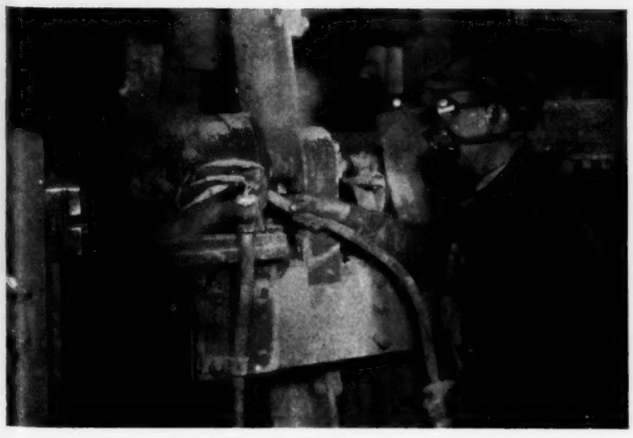
(3) *Take care of ball bearings.* Avoid overgreasing; clean the bearings periodically; inspect noisy bearings and replace immediately defective ones; keep grease containers clean.

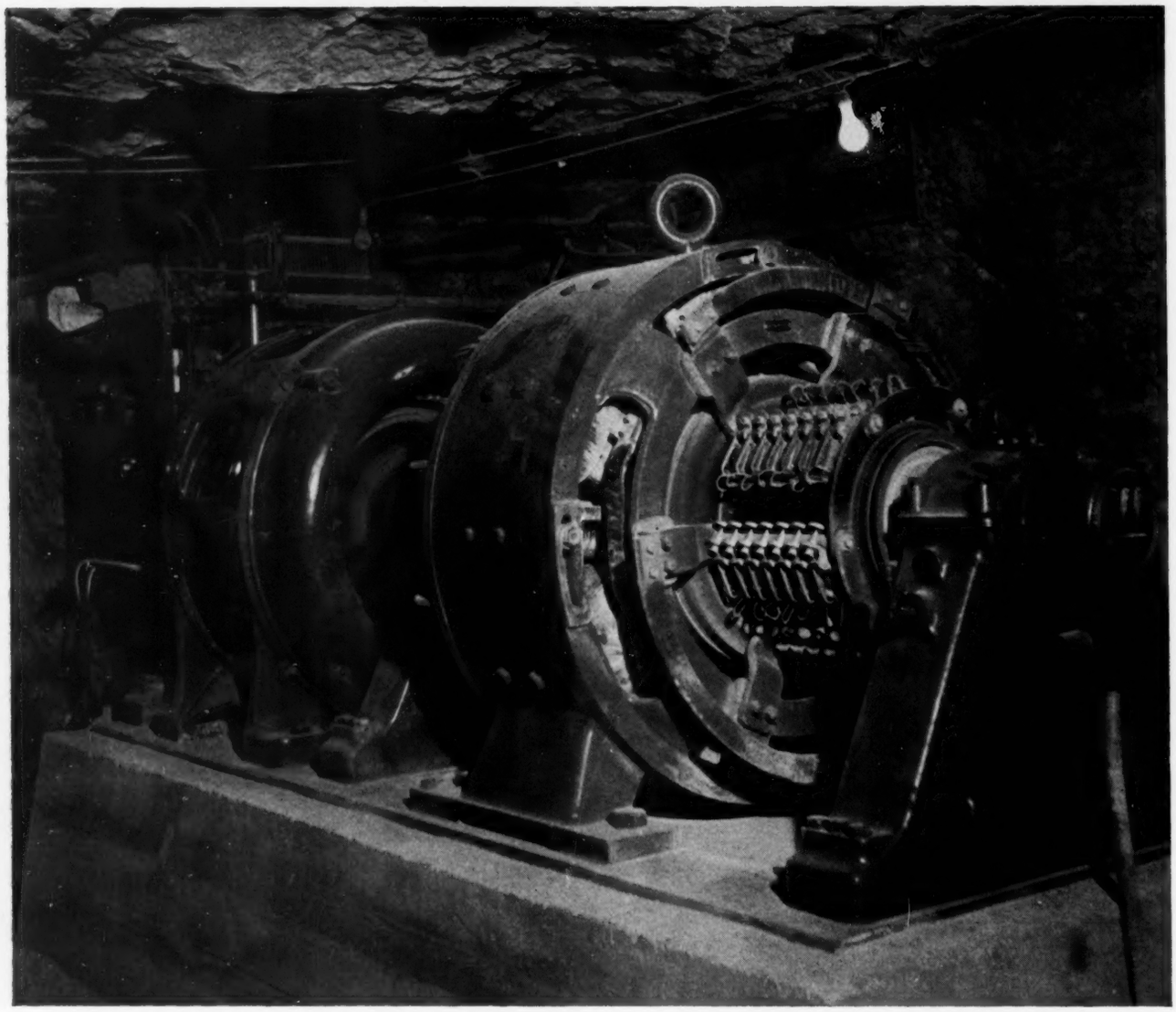


Above, 15 h. p., 440 volt, 3 phase, 60 cycle, open squirrel cage induction motor close-coupled to a centrifugal pump rated 300 gallons per minute.

Smooth operation and long motor life result when motors are properly oiled. Care should be taken to avoid using too much oil lest it contaminate the motor windings.

Adequate bearing protection and the correct grade lubricant is essential on jobs like this. Operator is blowing out a 5-h. p. open sleeve bearing motor driving feed table in raw grinding department.





Motor generator set comprising 250 h. p., 2300 volt, 3 phase, 60 cycle synchronous motor driving 150 kw., 250 volt dc generator for supplying power to haulage system in a large chemical company. Note cleanliness under conditions.

Most totally enclosed fan cooled motors use in their construction ball bearings equipped with sumps which help to prevent over-greasing. New grease periodically added in small amounts to the bearings, forces old grease into the overflow sump from which it should be removed.

Use a grade of grease recommended for the particular application which is affected by temperature.

Once every two years the bearing should be dismantled, thoroughly washed with Stoddard solvent or carbon tetrachloride, and repacked with the proper amount of new grease. Cleaning of ball bearings is not an easy operation, but this does not alter the recommendation for periodic cleaning if best life is to be obtained.

Bearing distress is indicated by excessive heat and noise. Unusual noises may be caused by broken retainers, nicked or broken balls. Any bearing showing distress should be inspected and if suffering from such faults should be immediately replaced. Overheating may be due to misalignment, excessive belt tension, and overload, any of which should be remedied if the bearings are distressed.

Abrasive dirt in grease is one of the principal causes of bearing trouble. It is important, therefore, that the container, from which grease is obtained for packing the bearing, be carefully protected against the entry of any foreign matter.

Although the totally enclosed fan cooled motor is the type most widely used in chemical plants there are other types in use. To maintain them properly becomes increasingly difficult as the degree of enclosure is lessened.

Splash proof motors are used in some instances and open motors still exist on some applications. Obviously, these types are subject to entry of moisture, dust, and gases, the immediate effects of which must be minimized by proper care.

Moisture alone is bad for any motor, but when carrying chemicals with it becomes exceptionally destructive. For motors operating in damp locations, therefore the following essentials must be met to avoid insulation breakdowns.

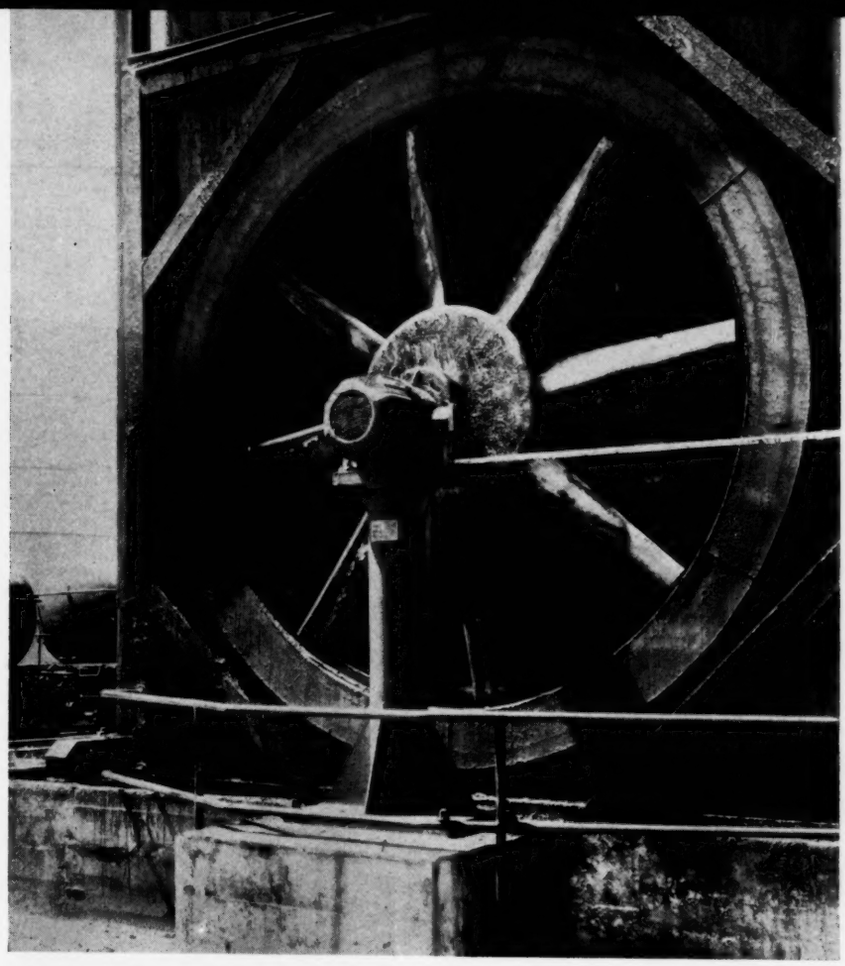
(1) Slot insulation must be of good type without a single broken cell.

(2) Both phase and cross connections must be adequately and specially insulated.

(3) All coils and insulation must have thorough treatment in a good baking varnish, usually about four dips and bakes, with a final coat of red, synthetic enamel.

Gases May Condense

Gases entering the windings may condense or combine with water to form injurious acids or alkalis to attack the motor. Only drying can obviate this condition. Often heaters can be advantageously placed on the motors to keep them dry during idle periods. In other instances, it is found advantageous to pass through one of the phase windings at low voltage, a small current which produces sufficient heat (I^2R loss in the winding) to keep the motor dry. In either method of keeping the motor dry the control can be easily arranged to connect the heater or to circulate current through the winding im-



Above, 20 h. p., 440 volt, 3 phase, 60 cycle, 1750 rpm totally enclosed fan cooled, squirrel cage motor as part of single reduction gearmotor operating at 335 rpm to drive exial flow cooling tower fan in a large soap plant.

mediately after the motor is disconnected from the line.

Dust or dry powdered chemicals which may accumulate on windings might not be directly injurious, but they will unquestionably increase the operating temperature of the motor by restricting ventilation and this in time will cause insulation breakdown, as it is well known that high temperatures shorten the life of insulation.

The measure of safe operation for insulation is the total temperature and not merely the rise above any ambient. For class "A" insulation this total temperature should not exceed 105° C. at the hottest part of the machine. Usually a 15 degree differential is allowed for the measured motor temperature and the inaccessible "hot spot," so that for motors with Class "A" or organic insulation, a temperature measured on the motor frame or winding should not exceed 90° C., or 194° F. Preferably operations should take place at lower values to indefinitely prolong insulation life.

If class "B" insulation (inorganic type like mica, glass, asbestos) is used on motors the aforementioned operation temperature can be safely increased to 110° C. or 231° F.

A thermostat applied on the stator coil ends furnishes the best available motor protection and enables the operator to load the motor to maximum safe operating temperature. With the overload relays on the control and an additional thermostatic device on the motor windings, damage will not result under single-phase or stalled conditions and the motor will have maximum protection.

In view of these definite temperature limitations for safe operation of insulation, the importance of keeping electrical equipment clean and dry is worth stressing; the more so since materials commonly used as insulation are non-conducting only when dry and clean.

It is common practice to use compressed air at about 50 pounds pressure to blow dust and dirt from motor windings. Pressures beyond 50 pounds are objectionable as they may loosen the binding tape. Care should be exercised in making certain that the compressed air directed against insulation is free from moisture that may have accumulated in the line from condensation.

When dust and dirt are not removable by compressed air, as will be the case when oil, grease, or moisture will cause the dust deposits to cake on the insulation, solvents will be required to completely clean the windings. The solvents commonly used for this purpose are of three general types.

(1) Petroleum distillates, such as benzine, gasoline, and Stoddard solvent (cleaners' naphtha).

(2) Carbon tetrachloride.

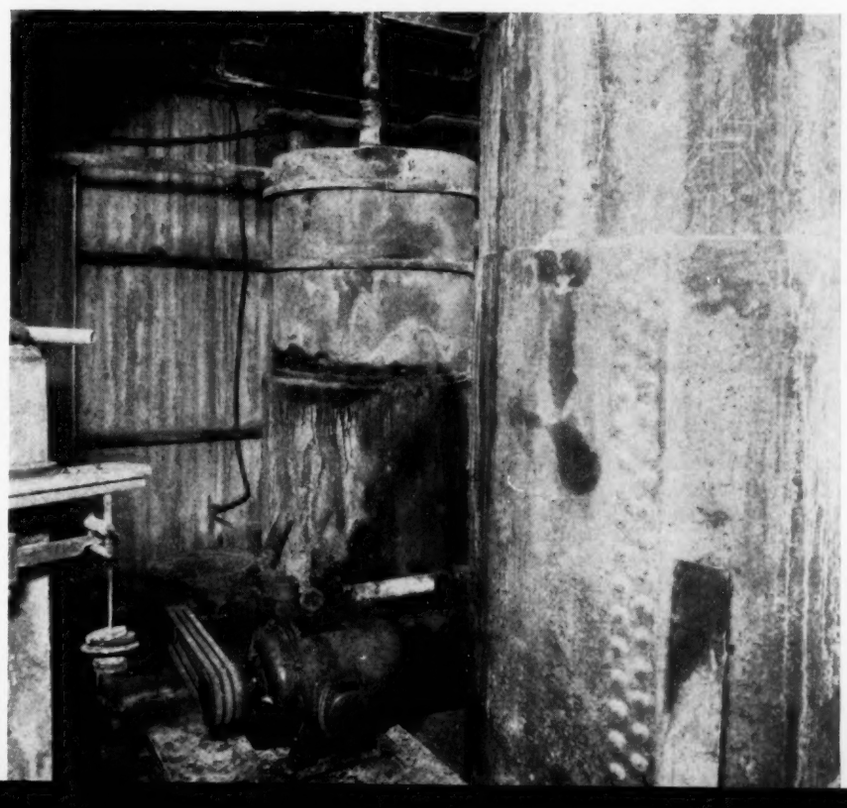
(3) A mixture of carbon tetrachloride and Stoddard solvent.

The petroleum distillates are the solvents having the least corrosive action on insulation varnishes, and for that reason, their use is preferable to others when conditions permit. An objection to the use of petroleum distillates is their extreme inflammability and the possibilities for explosions when mixed with correct proportions of air. This is particularly true when benzine and gasoline are used; therefore, extreme precautions must always be taken to avoid fires and explosions, by assuring good ventilation to prevent the formation of hazardous gas mixture.

Of the petroleum distillates used for cleaning purposes, Stoddard-type solvents are the least explosive and inflammable. These are to be preferred to benzine and gasoline since they minimize fire hazard. Stoddard-type solvents having a minimum flash point of 100° F. are readily avail-

(*Cont'd on page* 835)

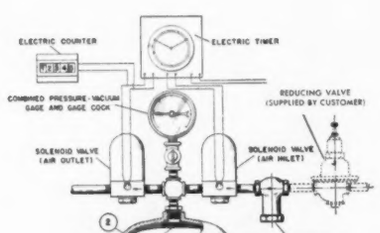
Below, 5 h. p., 440 volt, 3 phase, 60 cycle, totally enclosed fan cooled, squirrel cage motor, driving agitator in varnish plant, a difficult assignment.



NEW EQUIPMENT

Diaphragm Pump QC 178

A diaphragm slurry pump produced by Oliver United Filters, Inc., has the unique feature of being actuated without mechanical linkage or other mechanical connections to the diaphragm. A timed impulse is applied by compressed air or vacuum directly to one side of a floating diaphragm and through this diaphragm the energy is transmitted to the slurry or solution being handled on the opposite side. Being a single acting pump, it naturally produces an intermittent flow, although pulsations can be largely smoothed out by the use of an air chamber on the discharge line. A steady flow can be produced, however, by using two or more pumps actuated by a single timer but with pulsations staggered.



Parts Legend: (1) Casing (Body), (2) Cover, (4) Base (Tee), (31) Check Valve Ball, (32) Check Valve Cover, (34) Check Valve Gasket, (49) Outlet Flange, (50) Inlet Flange, (67) Check Valve Body, (77) Inlet Gasket, (78) Discharge Gasket, (173) Diaphragm.

This pump is said to be excellent for handling most hot or cold acid, neutral, or alkaline slurries or liquors which will flow. All parts coming in contact with the material being pumped are protected by synthetic or natural rubber, making the pump resistant to both corrosion and abrasion. It is claimed that lumps of materials, string, rags, etc., will not clog the pump provided they are small enough to pass through the ball-type valves.

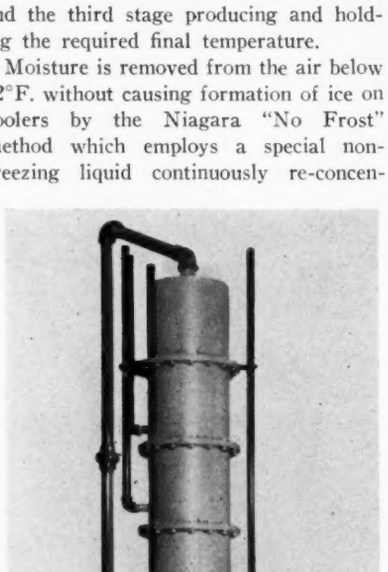
Since the flow through the pump can be varied over a wide range by adjusting the timing mechanism, it is practicable to proportion slurries or solutions.

Cold Room Equipment QC 179

Cold room air conditioners providing constant temperature as low as -50°F. to -80°F. are available for manufacturers required to test or normalize parts, materials and machinery at such temperatures, and for experimental laboratories. The Niagara "No-Frost" Method provides equipment for maintaining these low temperatures—and also for introducing fresh make-up air to these rooms at correct low temperature—in rooms large enough for full scale testing.

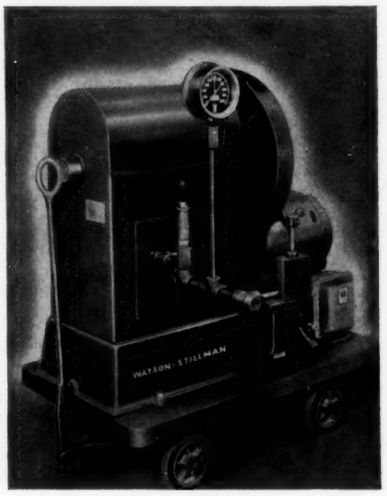
This new equipment using Niagara No Frost Liquid (no brine) gives constant operation without interruption or loss of capacity by reason of ice or frost forming on cooler coils or because of corrosion of the equipment from contact with brine or calcium. It consists of coolers operated in stages, the first stage reducing to temperature just above the freezing point of water and removing humidity; the second stage using the Niagara No Frost Method to remove the balance of the moisture, and the third stage producing and holding the required final temperature.

Moisture is removed from the air below 32°F. without causing formation of ice on coolers by the Niagara "No Frost" method which employs a special non-freezing liquid continuously re-concentrated in a Niagara concentrator (shown in the illustration) designed especially for this duty.



Test Pump QC 180

A new motor-driven, portable test pump is manufactured by The Watson-Stillman Co. for use in testing boilers, tubing and all kinds of high pressure vessels. The entire unit, including motor, is mounted on a hand truck for portability and all parts are enclosed for protection against foundry sand and other air-borne abrasives.



The pump is a three-plunger, vertical unit. Its ½" diameter plungers have a 2" stroke. Driven by a 3 H. P. motor at 100 R.P.M., the pump develops 8,200 lbs. per sq. in. maximum pressure at ½ G.P.M. capacity.

Equipment includes pressure gauge, safety valve, needle valve for pressure regulation, motor, motor starter, disconnect switch and 25 ft. rubber cable. Unusually compact, the entire unit is 50" long, 30" wide, 48" high and weighs 1,450 lbs.

Forced-Induction Pumps QC 181

The Lincoln Engineering Company, builders of engineered lubricating equipment, are now manufacturing forced-induction pumps known as the "Pile Drivers." These unique pumps are designed to dispense heavy, viscous materials such as sealing compounds, sound deadeners, insulating materials, putty, heavy lubricants and other substances too heavy and solid to prime in any other type of pump.

A number of these units are in service in the refrigeration industry where they are being used on production lines to deliver sealing and insulating compounds, on production line assemblies that must be loaded with lubricant or sealed before they are riveted or bolted, and in the production of many specialized products that must be gas and dust-tight.

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 178 QC 179 QC 180 QC 181

Name .....

Title ..... **Company** .....

Address .....

PLANT OPERATIONS NOTEBOOK

Editor's Note: This month we have several interesting contributions from W. F. Schaphorst, Mechanical Engineer, Newark, N. J. We invite other readers to send in their comments and any short articles on questions of interest to plant operating men.

Boiler Efficiency

As every reader doubtless knows, to measure boiler efficiency we are usually told to "find the heat in the steam evaporated by the boiler and divide it by the heat given up by the fuel." In other words, boiler efficiency, oven efficiency, stove efficiency, etc., is equal to output divided by input.

That being the case, why bother about steam at all in determining boiler efficiency if we know the quantity of heat that escapes up the chimney? Isn't it logical to conclude that the heat that "doesn't" escape up the chimney is absorbed by the boiler? To determine the output, then simply subtract the heat lost up the chimney from the original heat in the fuel. Now divide that difference by the original heat in the fuel and we have the boiler efficiency.

Obviously; with ideal combustion of fuel, and with a boiler that is perfectly insulated so that all waste heat would be confined to the chimney, the above rule would give very accurate results. But of course combustion is not always ideal, and regardless of the thickness of insulation some heat is bound to pass through the boiler walls.

Consequently rather than be guided entirely by theory, this writer studied the averages of a number of authoritative tests where the boiler efficiencies varied from a trifle over 60 per cent to more than 80 per cent. The heat value of the fuel was known and considered in each case, together with the temperature of the chimney or exit gases. As a result the following rule has been developed for gas fired boilers:

"Multiply the chimney gas temperature in deg. F. by 35.5 and divide by the heat value of the gas in B. t. u. per cu. ft. Subtract the result from 100. The remainder is the approximate boiler efficiency in per cent."

The above boilers, by the way, were fired by natural gas having a heat value varying from 980 to 1040 B. t. u. per cu. ft. In the event, therefore, that your heat values are considerably different the writer would advise caution.

For example, in one of the above tests the figures gave the maximum chimney gas temperature as 625 deg. F., at which point the boiler efficiency according to actual test was 78.3 per cent. The above rule gives its efficiency as 77.8 per cent, or one half of one per cent "off". The minimum temperature of the chimney gases during the same tests was 443 deg. F., at which point the boiler efficiency according to the actual test was 84 per cent. The above rule gives the efficiency as 84.3 per cent, which most engineers would regard as being "pretty good".

In applying this rule be sure that the boiler or heater, etc., is carefully operated. It is important that the CO_2 is up where it should be because excess air will give a "fake" result. In other words the rule is based on "good performance".

Pipe Bending Pointers

Dry sand, as most readers doubtless know, is commonly used as a packing for pipe bending, and it is an excellent material for the purpose.

Also, as many readers may already know, vibration is being used more and more these days for various engineering purposes. Thus for example vibration is now used for keeping materials moving in hoppers, bins, silos, and chutes; for vibrating screens; for vibrating molds and forms; for packaging; and even for unloading railroad cars. It is an excellent method.

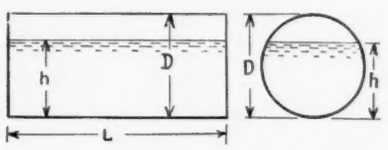
In the first applications of vibration it was thought that the best way was to stand the pipe on end on a vibrated platform, the lower end of the pipe first being sealed. The method "worked", but it was found that the results were not always entirely satisfactory. It was found that more sand could still be packed into the pipe by hammering the sides of the pipe.

Packing was tried in various ways and it finally was learned that the most successful method is to attach a vibrator to the *side* of the pipe by means of a chain clamp, with the pipe standing in a vertical position and with the lower end sealed, as before.

Then, after the pipe is filled and vibrated until it will not hold any more sand by that process, additional sand can still be forced into the pipe by pounding the pipe with a sledge hammer for a short period of time.

Measuring Content of Tanks

Here are some new rules which make it possible for anyone who can do arithmetic to determine the number of gallons of water or other liquid in any horizontal cylindrical tank. Referring to the sketches:



h = the height of the liquid, in inches;
L = the inside length of the tank, inches;
D = the inside diameter of the tank, inches.

First: when the tank is half full, or less than half full.

A—Subtract h from D, multiply the difference by h, extract the square root of the product, and then multiply by 1.5

B—Multiply D by h and extract the square root of the product

C—Add the results of A and B

D—Multiply L by h and then multiply that product by .0023

E—Multiply the results of C and D. The answer is the number of gallons of liquid in the tank.

Second: when the tank is more than half full

F—Square the diameter D (That is, multiply the diameter by itself) and multiply the product by .0034

G—Subtract h from D and multiply the difference by .0023

H—Subtract h from D, and multiply the difference by h, extract the square root of the product, and then multiply by 1.5 (In other words, this is the same operation as A, above)

I—Subtract h from D, multiply the difference by D, and extract the square root of the product

J—Add the results of H and I and multiply the sum by G

K—Subtract J from F and multiply the difference by L. The result is the number of gallons in the tank.

The above rules are based on a modification of Prof. John Goodman's formula for determining the areas of segments of circles. The original formula may be found in Goodman's "Mechanics Applied to Engineering."

Good News FROM AUSTRALIA!

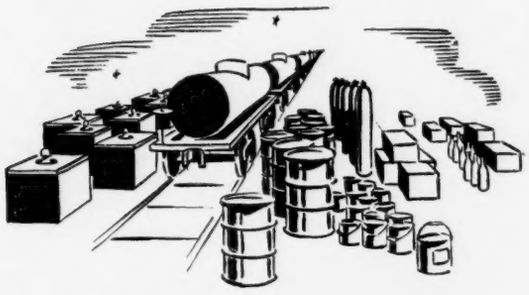
FIGHTING and bombing planes in constantly increasing numbers are arriving at American bases "Down Under." And products of James Good, Inc., of Philadelphia, Pa., in constantly increasing quantities are being supplied to keep them fighting!

"Good" Castor Oil for aircraft engine lubrication, "Good" Petrolatum for light lubrication and rust prevention, and "Good" Carbon Tetrachloride for fire extinguishers . . . are all being shipped in Crown Containers made to meet Army, Navy and Marine Corps specifications.

Many manufacturers in addition to James Good, Inc., have been gratified to learn that Crown containers meet rigid Government specifications without alteration.

CROWN CAN COMPANY, PHILADELPHIA, PA., *Division of Crown Cork and Seal Company.* Baltimore • St. Louis • Houston • Madison • Orlando • Fort Wayne • New York • Nebraska City

INDEPENDENT AND HELPFUL CROWN CAN

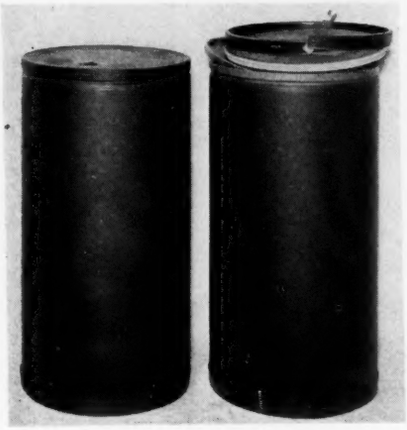


PACKAGING & CONTAINER FORUM

By Richard W. Lahey

Fibre Drums as Substitutes for Steel

That Fibre Drums may be available as suitable substitutes for steel drums has again been demonstrated by the approval of the Bureau of Explosives of a special



New fibre drum of Carpenter Container Corp.

type of fibre drum as a safe container for Sodium Hydrosulfite. The fibre drum approved was tested first for its ability to withstand shipping and handling when filled, and then by letting it lie on its side outdoors for several weeks during which time there were several rainfalls. The contents remained dry and with all of its life preserved intact.

The tested drum was made according to I.C.C. 21 A specifications with a fibre body closed at each end, with solid wood head and steel rim. It had a special air-proof and waterproof coating on the inside and was painted all over on the outside. It had a full removable top. A waterproof seal extended completely across the top, separating the wood head from contact with the contents.

Fibre drums are familiar to most shippers of dry chemicals, but the fact that they have recently been improved and are now available for many products not dry, and for semi-liquids, will be welcome news to shippers who are now required to do without steel drums. These fibre drums are available for greases, emulsions, textile sizings, adhesives, petroleum, lanolin, cosmetic creams, lard, shortening compounds, syrups, pie fillings, as well as for such extremely hygroscopic products as banana powder, dry molasses, and ammonium thiocyanate.

Fibre drums are made in standard sizes from one to sixty gallons for loads up to 400 lbs., and are available with any of several different types of inside coatings and outside finishes. The manufacturers are prepared to collaborate with shippers to determine the correct type needed for each particular product. They are worth investigating as possible substitutes for steel drums.

Steel Drums

The current shortage of steel is critical and it is probable that as time goes on less and less steel will be available for the fabrication of containers. Continuous strip mill capacity has been converted to plate production and hand sheet mills are having difficulty in obtaining sufficiently high priority ratings to obtain strip and bar stock for rolling.

Shippers should immediately arrange to substitute non-metallic containers to replace steel containers wherever possible. This is particularly advisable where steel containers are used for non-dangerous dry materials, pastes and highly viscous liquids. It is also probable that dry materials which are classed as dangerous by the ICC Regulations may have to be packed in non-ferrous containers where safe substitute packages can be found.

Glass Container Designs Frozen

W.P.B. Order L-103 freezes all glass container designs effective immediately. This limitation of glass containers to existing molds along with a program of standardization and simplification is expected to increase glass bottle production by 30 per cent without increasing consumption of soda ash or other glass-making materials. The following exceptions have been made:

(1) When supplementary order is issued by WPB specifically authorizing the use of a design not previously made in glass; (2) When no suitable glass container exists for packing a product not previously packed in glass; (3) When it is necessary to design a special glass container in order that it can be used on an existing filling and packing line previously used for containers made from other materials; (4) When a minor change in an existing permitted container design will result in a glass container that is lighter in weight in proportion to its capacity, or in a glass that can be made faster or more efficiently, or of better quality, except that such change shall not be permitted unless the former design is then abandoned; (5) Any new design permitted by 2, 3 or 4 must be submitted to WPB for prior approval before it can be used.

Revised Carboy Manual Issued

MCA Manual Sheet C-1, the shippers' manual covering service requirements of the ICC Specification 1A boxed carboy, has been completely rewritten and revised, and is now available in quantity at the Washington office. Originally issued in 1935, the manual in its revised form is comprehensive in scope and now comprises 15 pages of text, with 19 illustrations and drawings. New subjects dealt with include closures, box car loading, and reconditioning of porous closures. The illustrations and sketches are new and show modern equipment throughout. The price is 25c each postpaid from Manufacturing Chemists' Association, 608 Woodward Building, Washington, D. C.

Take Care of Your Bags

Since the Second World War started in 1939, there has been a tremendous demand for sand bags for use in military operations and for the protection of civilian lives and property. Bags are also needed in large quantities for shipping foods such as flour, salt, sugar, rice, beans, potatoes, coffee and many others. When the United States entered the war, the need for more bags became at once apparent. This has resulted in a shortage of materials to make bags.

With the war spreading to the Indian Ocean and sinking of cargo ships therein, the burlap supply has dwindled. It is possible that shipments of burlap, which come almost entirely from India, may be cut off completely for a time.

To offset the loss of burlap, the production of cotton goods for bag making purposes has been increased. Paper bags have also taken up some of the slack caused by the burlap shortage.

The Office of Agricultural Defense Relations in Washington, D. C., foresaw the possibility of bag shortages several months ago and made definite suggestions for conserving the bag supply. In co-operation with the government, Bemis Bro. Bag Co. is supplying bag users with slips (sample attached) giving instructions for taking care of bags so as to make them last as long as possible. Bag users are distributing these slips to their customers by attaching them to letters, invoices, statements, etc. Thus, the importance for taking care of bags is brought directly home to bag users. These instructions follow:

Care of FILLED Bags

1. Store all commodities in a dry, protected place.
2. Handle bags with care, to avoid dropping and rupturing.
3. Use no hooks in handling bags.
4. Stack all of a kind together because the strength of the bag cloth varies with the commodity.
5. Don't stack filled bags so high that the weight ruptures the bottom bags.
6. Protect the commodity from rats to prevent damage to bag as well as to its contents.
7. Allow no chickens or animals access to bags.
8. Open bags at seam by cutting stitching instead of cloth.
9. Remove commodities containing acids as soon as possible.

Care of EMPTY Bags

1. Shake thoroughly to remove as much of commodity as possible.
2. Hang all bags in the sun to dry to prevent mildew and rot.
3. Do not use kerosene or objectionable chemicals in cleaning bags.
4. Store dried bags, each kind to itself, in a high, dry place.
5. Inspect regularly to prevent rats or vermin nesting.
6. Do not fill bags to be reused with objectionable items like coal, etc.
7. Tie the bags into bundles and sell them as containers.
8. Do not fill bags too full as this causes excessive strain on the cloth in handling.

Sorting Bags

1. Careful sorting pays for itself by obtaining higher prices from bag dealers.
2. Pack bags flat.
3. Avoid putting bags of different materials, different capacities, different sizes, or bags for different commodities in the same bundles.
4. Sort into bundles all bags that can be used again for the commodity originally packed.
5. Bundle all patched bags separately.
6. Keep slashed bags together.

This is an important conservation step. Every bag user is being urged to do his part by co-operating and thus help solve one of the pressing supply problems.

Callahan and Crass Given Testimonial Dinner

On April 28th the Technical Committees of the Manufacturing Chemists Assn. held a testimonial dinner for T. P. Callahan of Monsanto (left) and M. F. Crass of Du Pont (right). They retired as of December 31st, 1941, after many years of active service for their respective companies and for the Technical Committees of the M. C. A. They were each presented with framed hand lettered resolutions in appreciation of their many accomplishments in chemical packaging.

Poster Helps Shippers

Shipping department managers faced with conserving materials and the responsibility of safe, speedy, effective packing will find valuable information for their departments in the large wall poster on sealing procedure offered by the Hinde & Dauch Paper Co., Sandusky, Ohio.

Prepared from information supplied by the company's Package Laboratories, the poster, measuring 12″ by 15″, is printed in two colors and covers use of all four sealing materials—gummed tape, adhesives, metal stitches, and metal straps or wires. The poster is packed with such specific suggestions as how to keep adhesives while not in use, how far apart stitches should be placed, how to facilitate adhesion of gummed tape, and how tight to draw metal straps or wires.

Copies of the poster may be obtained simply by writing direct to The Package Laboratory, The Hinde & Dauch Paper Co., Sandusky, Ohio. The company suggests that enough copies be requested so that one may be posted in each strategic point in the shipping room.

Glass Containers Simplified

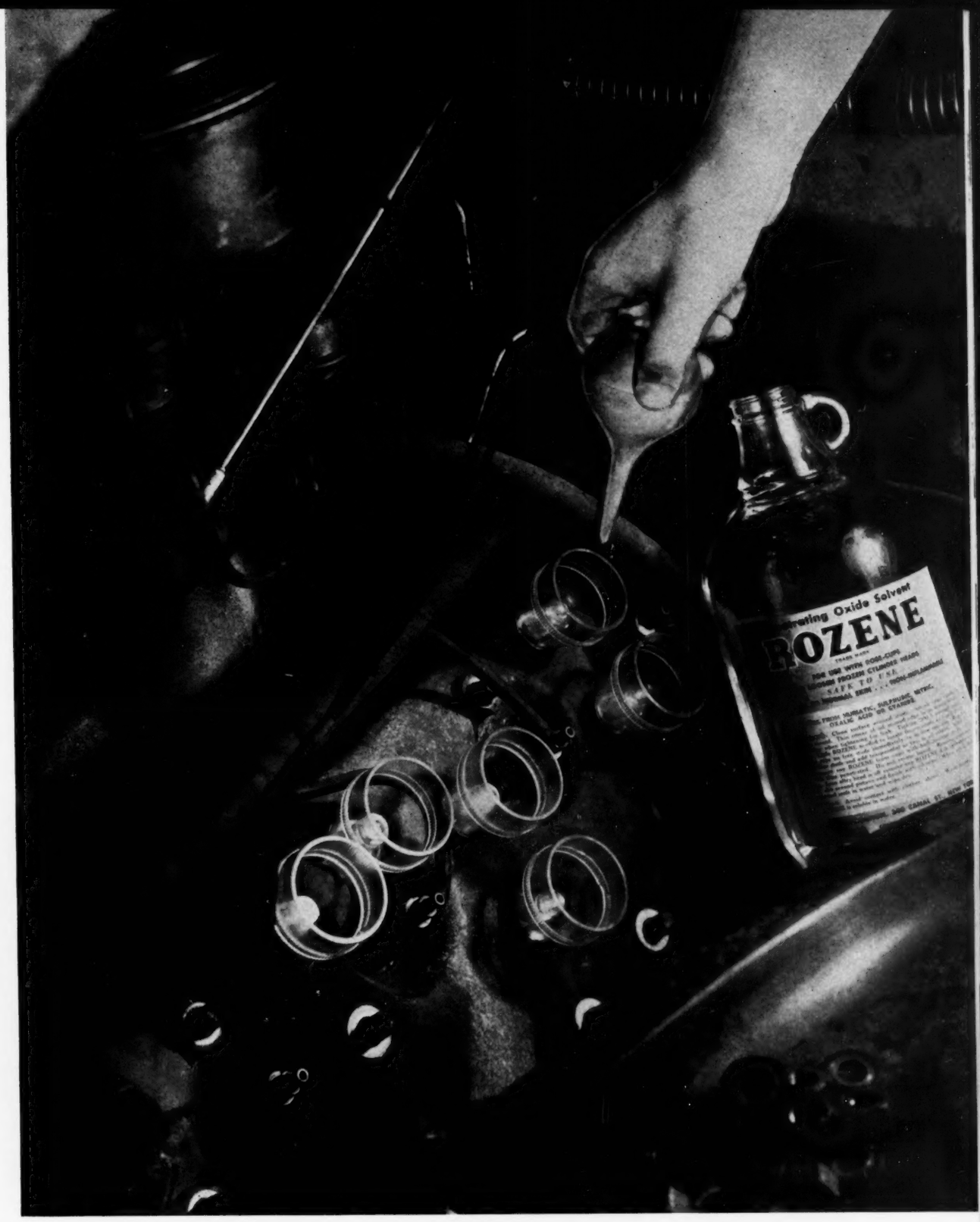
In order to comply with the Government's program of economy in essential war materials, the glass industry has adopted a simplified line of containers for the packaging of foods in co-operation with the United States Department of Commerce. Manufacture of these streamlined glass jars and bottles will effect great savings of metal and other materials vital to our war effort.

The new line of a dozen jars and half a dozen bottles for a wide variety of foods and liquids are known to the trade as economy containers for obvious reasons. Elimination of fancy or unusual bottles and jars—requiring special and expensive iron molds—will result in large metal savings. Smaller openings with resulting smaller closures for jars will conserve great quantities of rubber, metal, cork and other essential materials. Metal consumption for closures alone can be reduced 20 to 40 per cent.

Although the new line of glass containers will be simplified, the quality of the glass remains unchanged. Millions of the new economy bottles and jars are being made by the new Duraglas technique which insures lighter, but stronger containers and is the most economical process for manufacturing glass yet discovered.

Greater quantities of wartime economy glass containers will be produced, it is contended, for such commodities as baby foods, vegetables, fruits, peanut butter, coffee, mayonnaise, pickles, salad dressing, fruit and vegetable juices, mustard, jams, jellies, preserves, malted milk, vinegar, syrups, salad and cooking oils, drugs of all kinds, and hundreds of other products.

Products which have been packed in glass in the past will retain their identification through their familiar labels. Those previously packed in other materials will also bring their own labels to the new glass container.



CHEMICAL SPECIALTIES

Anti-Rust Corp. of New York City, makes this penetrating oxide solvent "Rozene" to loosen frozen cylinder heads. Solution is poured into plastic cup, as shown, around frozen studs in cylinder head to dissolve corrosion and rust permitting its ready removal without destroying the head. Cups are Plastacele, a plastic molded by Caldwell Products.

Industrial Agricultural Household

Automobile Cleaners and Polishes

Another in a series of articles on chemical specialties by C. T. Small, Ph.D.

PERHAPS some people will get so discouraged in time with their old car that they won't care how it looks, but most will no doubt make the best of a difficult situation and keep it looking as well as possible. Simple economics dictate that car owners make even greater use of automotive chemical specialties that will add months, yes, even years to their property.

Aqueous Cleaners

New cars ordinarily need only washing to keep them looking bright and attractive. Many of the present-day car bodies are

Whether your car is new or old, you're going to have to keep it in good condition until the war is over and then some. C. T. Small predicts that automobile cleaners and polishes will be in great demand for keeping outward appearances up to par. Accordingly, this report.

finished with a synthetic-resin varnish, more durable and more generally satisfactory than the lacquer-type finish, which deteriorates by weathering and exposure to sunlight. Special detergents of various kinds are marketed for washing cars. Some of these are simple potash-soap pastes containing about 35-40 per cent. of soap including a small proportion of rosin soap. This dissolves readily in cold or warm water to give a good sudsy solution. Thorough rinsing is necessary and is usually followed by rubbing dry in order to get the best appearance. Otherwise the soap might leave some streaks and spots. Soap tends to do this even under the best of circumstances, as anyone knows who has tried to wash windows with soap solution instead of dilute ammonia, dilute alcohol, or other more suitable liquid.

Products which claim superiority because no wiping dry is necessary contain synthetic detergents or wetting agents in place of soap. These all require thorough hosing of the car after use, but being highly water-soluble, should be removed readily without leaving spots or streaks. One such powdered product contains about 9 per cent. of synthetic detergent, about 0.5 per cent. of trisodium phosphate, an alkaline salt which serves to neutralize acidity in the soil—the rest being a filler or extender of inert salts, sodium sulfate and sodium chloride.

A liquid contains about 8 per cent. of a synthetic sulfonated ether, 2 per cent. of sodium sulfate and sodium chloride, the rest water. Still another liquid contains about 13 per cent. of a naphthenic sulfonate, a little cresylic acid, the rest water. The cleansing power of these latter products appears to have inspired the greatest confidence in the producers, who recommend dissolving about one ounce of the material in a pail of water, 10 quarts. It is hard to imagine this concentration of naphthenic sulfonate having much cleaning action, since it is primarily a wetting agent rather than a real detergent. In any event such washing is intended to remove light soil—minor mud spatters mostly; it could not be expected to be very efficient against a greasy surface. With a very light type of soil most of the work of cleaning is done by the friction of rubbing and not by the cleaning solution. A wetting agent in sufficient concentration is no doubt useful in wetting the soil so that it can be loosened and rubbed off more easily.

Tar Removers

Liquids sold to remove tar, road oil, and grease spots are nonaqueous. They may be any of a number of grease solvents, such as petroleum naphtha or Stoddard's Solvent, coal-tar naphtha, gas-house drip, crude xylene, or petroleum-oil fractions boiling over fairly wide ranges, which might correspond to a mixture of kerosene with a higher-boiling hydrocarbon fraction. These solvents are recommended for removing oily spots and tar, or by some makers to "dry-clean" the whole car. In the latter case the liquid can be applied with a spray or atomizer in the same way that window-cleaning liquids are used, being rubbed off before evaporation can occur. These are not suitable for use when water washing is really needed. The analogy to dry-cleaning is appropriate, since Stoddard's Solvent is a dry-cleaning fluid for cleaning garments.

Emulsion Polishes

Emulsion polishes contain mineral oil as the polishing agent in a form easy to work with because emulsified with water, the latter being the external phase. Because of this these polishes can be applied directly after the car is washed and while it is still wet. They give more luster than can be obtained with washing alone to make a car look more like new, whose finish may be somewhat dull or slightly weathered.

Approximate formulas are as follows:

1.	Light mineral oil	42%
	Castor oil	5
	Ammonia soap	2
	Xylene	5
	Water	46
2.	Light mineral oil	38%
	Castor oil	10
	Potash soap	1
	Water	51
3.	Coal-tar naphtha	9%
	Light mineral oil	27
	Blown castor oil	6
	Ammonia soap	3
	Water	55
4.	Coal-tar naphtha	16%
	Light mineral oil	17
	Blown castor oil	10
	Ammonia soap	3
	Water	54

Soap is the usual emulsifying agent, potash or ammonia soap being more suitable than ordinary soda soap in helping produce a thin liquid. The thinner the liquid the easier for the worker to spread it. Only a very fine film of oil should be left after polishing, as too much oil will be sticky, picking up dirt instead of merely leaving a reasonably lasting luster. This also means that the oil itself must be light, of low viscosity.

The mineral oil may have a specific gravity at 60° F. of 0.84-0.89. Castor oil gives greater depth and brilliance to the luster produced by mineral oil. Blown castor oil has had air blown through it, which makes it somewhat thicker. Xylene and naphtha serve as volatile diluents for the mineral oil and promote evaporation. The oil wets the surface of the car preferentially, which explains why a slight film remains even after rubbing.

Preparation of these polishes consists of simple mixing. The oil is stirred with the solvent and this mixture poured with vigorous stirring into the aqueous solution of soap, which may be warmed somewhat if desired. Sometimes the fatty acid such as oleic acid or red oil is dissolved in the oil phase, the ammonia or caustic potash in the water, then the two mixed with warming to promote the formation of soap. Stirring should be continued until the reaction is complete and the product homogeneous. Most of the commercial emulsions are completely stable; those having a very high proportion of mineral oil may separate into two layers, requiring shaking before use.

Cleaner Polishes

Probably most numerous among all the types of cleaners and polishes sold for automobile upkeep are those called cleaner-polishes which both clean and polish in one operation. These have met with wide favor because they are fairly easy to apply, can be rubbed up quickly, and give good results in terms of appearance. Like the emulsion polishes, they depend for gloss on mineral oil, sometimes with a saponifiable oil added. Instead of soap, water-soluble gums such as gum arabic or gum tragacanth are commonly used as emulsifiers. These gums have good emulsifying power for this type of mixture, but tend to have a thickening action. Soap may detract somewhat from the gloss, while the gums do not. The proportion of gum has to be kept low so that the liquid will not be too thick.

Unlike the emulsion polishes, these products contain a soft abrasive, diatomaceous earth. This is the cleaning agent because it has a scouring effect, loosening and removing by friction the solid soil which may have accumulated on the surface of the car. Although in a sense the abrasive may be said to have a scouring effect, it is far too mild to scratch the finish, being the soft abrasive used in silver polish. In

using this or any other polish, care must be taken that coarse grit adhering to the car surface is not rubbed over the finish to leave scratches. Wetting agents may also be present, glycerine having been much used for this purpose. Alcohol is sometimes added. Examples of commercial products indicate that considerable variation in composition can be made without departing from fundamental principles.

A product which may be considered to be basic in composition contains approximately the following:

Light mineral oil, sp. gr. at 60° F. 0.879	15%
Glycerine	2
Water-soluble gum	0.1
Diatomaceous earth	11
Water	71.9

The proportion of gum present as emulsifying agent is certainly reduced to a minimum in this. Diatomaceous earth, because it is so light and fluffy, probably aids in stabilizing the dispersion. The polish is rubbed over a small area of the car body with a pad of soft cloth, allowed to dry, and then wiped off with a clean cloth. Dirt is loosened during the original application then removed with the abrasive afterward.

Two products very similar in composition are as shown:

Kerosene	9%
Light mineral oil	5
Water-soluble gum	0.25
Glycerine	4
Denatured alcohol	5
Diatomaceous earth	13
Water	63.75

Petroleum naphtha	5
Light mineral oil	8
Water-soluble gum	0.7
Glycerine	3
Denatured alcohol	6
Diatomaceous earth	14
Water	63.3

Both contain a light petroleum solvent to serve as diluent for the mineral oil, kerosene and naphtha respectively, and both contain two wetting agents, glycerine and alcohol. To the uninitiated, however, they might seem quite different, since one is colored brown, the other pink. In the mind of the layman color is often considered a distinctive feature although technically it may have no significance. Many of these products are colored tan, brown, orange, blue, pink, red or green, according to the fancy of the maker, by the use of a water-soluble dye or a small amount of inorganic pigment. Some contain a cover odor much as that of pine oil.

Further examples to illustrate modifications made by the individual manufacturer are the following:

1.	Light mineral oil	7%
	Water-soluble gum	0.5
	Glycerine	4
	Ammonium chloride	0.2
	Alcohol	13
	Diatomaceous earth	13
	Water	62.3

2.	Light mineral oil	10%
	Blown castor oil	1
	Water-soluble gum	0.5
	Glycerine	4
	Ammonia water	0.1
	Diatomaceous earth	10
	Water	74.4

3.	Light mineral oil	6%
	Petroleum naphtha	4
	Glycerine	5
	Water-soluble gum	0.4
	Triethanolamine	0.1
	Fatty alcohol sulfate	0.1
	Diatomaceous earth	10
	Water	74.4

Ammonium chloride is probably added just to be different. Ammonia, triethanolamine, and a fatty alcohol sulfate would all act to promote wetting of the soil by the polish.

Preparation is similar to that of emulsion polishes. Oil and solvent, when present, are mixed in one kettle and the abrasive and pigment, if any, sifted into this with rapid stirring. The gum is allowed to stand in a portion of the water, as it takes time for it to swell and dissolve. This solution and all other water-soluble ingredients are stirred into the water in a second kettle. The oil mix is then added slowly to the aqueous solution with strong agitation until a smooth homogeneous product is obtained. If dye is used this is dissolved in a small portion of the water and the solution then stirred into the rest of the water. Odorant may be dissolved in either the aqueous or oil phase according to its nature.

In the past, cleaner polishes have been packed in lithographed cans holding from 12 to 16 fluid ounces. They can just as readily be bottled as they should always be thin enough to pour readily. Prices have varied anywhere from 35 cents to a dollar for the same amount of product and even with the ingredients not differing to any startling degree.

A modification which probably reflects the present-day trend in cleaner polishes is the inclusion of a small proportion of wax. carnauba—a hard wax—being most suitable. These polishes are also oil-in-water emulsions. While 1 per cent. of wax, the proportion frequently present, may not sound like much, actually its proportion in the polish film left on the car may be quite different, 10 per cent. or more. The wax is dispersed in oil or solvent, which preferentially wets the surface of the car, so that it can be rubbed up to leave a light film, the water and volatile solvent of course evaporating. The presence of a hard wax in the film makes a much more permanent and durable polish, not requiring the frequent renewal necessary with a simple oil film. Because of the presence of the wax, no doubt somewhat more work is required in rubbing it up. Some producers claim their finish will last for months—that the surface will only need buffing at intervals during this time to bring out the luster of the hard wax film.

Resemblance to the cleaner polishes already discussed will be seen in the following formulas:

1.	Light mineral oil	9%
	Carnauba wax	0.6
	Glycerine	5
	Water-soluble gum	0.5
	Ammonia water	0.3
	Diatomaceous earth	11
	Water	73.6

2.	Light mineral oil	17%
	Carnauba wax	0.5
	Glycerine	3
	Water-soluble gum	0.5
	Diatomaceous earth	11
	Water	68

3.	Light mineral oil	8%
	Carnauba wax	1
	Glycerine	5
	Water-soluble gum	0.2
	Triethanolamine oleate	0.2
	Diatomaceous earth	17
	Water	68.6

In formula 2 the high proportion of mineral oil makes a rather viscous liquid. In formula 3 a combination of emulsifying agents, the gum and the triethanolamine soap, is a good device to increase efficiency with a low proportion of emulsifier; each probably enhances the effect of the other since both types are colloidal.

Preparation is similar to that for the other cleaner polishes except that with these the wax must be melted and stirred into the oil, the latter preferably being warm. The abrasive is sifted into this with stirring and the oil phase added to the aqueous solution with vigorous stirring.

Other commercial products have the approximate formulas:

1.	Light mineral oil	8%
	Petroleum naphtha	8
	Carnauba wax	1.5
	Paraffin	0.5
	Glycerine	5
	Water-soluble gum	0.1
	Ammonia soap	1.5
	Diatomaceous earth	13
	Water	62.4

2.	Light mineral oil	7%
	Kerosene	3
	Carnauba wax	2
	Glycerine	7
	Triethanolamine	0.1
	Water-soluble gum	0.4
	Diatomaceous earth	12
	Water	68.5

3.	Kerosene	11%
	Carnauba wax	1.7
	Glycerine	4
	Ammonia water	0.2
	Water-soluble gum	0.4
	Diatomaceous earth	11
	Water	71.7

4.	Mineral oil	9%
	Castor oil	3
	Stoddard's Solvent	18
	Carnauba wax	0.8
	Soda soap	0.5
	Bentonite	2
	Diatomaceous earth	7
	Water	59.7

In formulas 1 and 2 the mineral oil has been diluted with a solvent, in formula 3 it has been omitted altogether and a volatile solvent used alone, while in formula 4 a saponifiable oil with a diluent are both used with the mineral oil. In the first formula a soft wax has been added to the carnauba, a practice not generally followed; combined emulsifying agents appear again here, a minimum of gum being used. The bentonite in formula 4 is a colloidal clay which promotes dispersion; it gives the product a slippery feel. When present its proportion should be kept low. Bentonite has no abrasive or cleaning action.

Comparable to the impregnated cloth sold for polishing silver, impregnated flannel for polishing cars has been prepared. Analysis of such a cloth showed it to contain wax and superfatted soap. This has no doubt been emulsified in water, the superfatted soap serving as emulsifying agent for the wax. Possibly a volatile solvent was also present in the impregnating fluid. The ingredients per square yard of cloth were:

Carnauba wax	1.6 grams
Paraffin	1.6 "
Soda soap	2.3 "
Oleic acid	1.0 "

The use of such a cleaning and polishing cloth would be expected to require more labor to get results, and for this reason it is not apt to be a serious rival to the polishing fluids.

Pre-wax Cleaners

To clean a finish which has deteriorated to the extent that a thorough waxing job needs to be done, special pre-wax cleaners are sold. To remove road haze, dirt, old wax, and anything else that should come off, emulsions are made containing a higher content of abrasive than is present in the cleaner polishes, and in nearly all cases a harder abrasive than diatomaceous earth. Examples of liquids are the following:

1.	Light mineral oil	9%
	Glycerine	3
	Ammonia water	0.2
	Water-soluble gum	0.25
	Diatomaceous earth	18
	Water	69.55
2.	Mineral oil	13%
	Castor oil	3
	Soda soap	0.4
	Tripoli	30
	Bentonite	1.6
	Water	52
3.	Kerosene	6%
	Triethanolamine	0.2
	Sodium oleate soap	3
	Water-soluble gum	0.2
	Tripoli	30
	Bentonite	1
	Water	59.6

Formula 1 is the exception rather than the rule, in that it contains the soft abrasive diatomaceous earth, used in cleaner polishes although in somewhat higher proportion. Formulas 2 and 3 are more typical of liquid pre-wax cleaners. Tripoli is a fine abrasive of medium hardness, which means it is quite a bit harder than diatomaceous earth. It is comparable to the abrasive used in brass polish and in the lacquer-rubbing compounds in automobile plants. Its cleaning action, or scouring action, is greater than that of diatomaceous earth; some manufacturers recommend these products for cleaning badly oxidized finishes. These liquids are heavier and thicker than the cleaner polishes because of the greater proportion of solid abrasive. More emulsifying or dispersing agent—soap, gum, bentonite—is required to produce a stable suspension so that the abrasive won't settle to the bottom. Formula 3 utilizes all three types of dispersing agents. These products are rubbed over the car surface until the latter is thoroughly cleaned, and are then wiped off while still wet.

Many of these products are made up as pastes—in fact pastes have been more popular than liquids—by reduction in the proportion of water from 60-70 per cent to 30-40 per cent.

1.	Light mineral oil	6%
	Kerosene	6
	Pine oil	2
	Sodium oleate coap	4
	Tripoli	45
	Water	37
2.	Light mineral oil	9%
	Petroleum naphtha	21
	Carnauba wax	4
	Paraffin	2
	Sodium silicate	3
	Sodium stearate soap	3
	Tripoli	26
	Water	32
3.	Kerosene	19%
	Carnauba wax	5
	Paraffin	3
	Sodium soap	2
	Water-soluble gum	1
	Tripoli	33
	Water	37

When soap is used, it is always in the form of soda soap which promotes paste-like consistency. Formulas 2 and 3 contain wax as polishing agent and may be intended to serve as wax cleaners so that subsequent waxing is not necessary. Some overlapping therefore exists between these and the cleaner polishes; they are placed among the cleaners here because of their high content of moderately hard abrasive. If the wax were left out they would resemble the usual pre-wax cleaners. In formula 2, sodium silicate, an alkaline salt, is present as a "soap builder" and neutralizer for acidity in the soil.

Wax Polish

Wax polishes are pastes high in wax content. They are applied only after the car has been well cleaned, as with the special cleaners just discussed. Their purpose is to replace the gloss worn off by time and weather, involving considerable labor, but justified by the lasting finish obtained. They resemble paste floor waxes.

The commercial automobile wax polishes, are all very similar, differing from one another in the proportions of ingredients present, not in the ingredients themselves. A mixture of hard and soft wax is dispersed in naphtha such as Stoddard's Solvent. The usual total-solids content is 22-28 per cent, the proportion of naphtha 72-78 per cent. Carnauba has been used mostly as the hard wax, paraffin as the soft. Several products contain these in proportions of 1:1; some contain two or three parts of carnauba to one of paraffin, and some contain one of carnauba to two or three of paraffin.

To prepare these the waxes are melted and mixed together, then stirred with the warm solvent and cooled quickly. Most of the products are colored with an oil-soluble dye. They have previously been packed in flat cans of 5 to 8 ounce capacity, but could just as well be put in thick glass jars, in the event cans are hard to obtain because of war conditions.

Carnauba Scarce

The expensive ingredient is the carnauba wax, the amount of this used naturally being reflected in the price since the products necessarily vary a great deal in cost. Whether carnauba wax can be bought, or just what waxes will be available in the future, is an open question. Carnauba has the best polishing properties of any of the hard waxes, others approaching it somewhat in properties being ouricuri and candelilla. Paraffin is mixed with the hard wax to soften or plasticize the latter so that it will spread smoothly.

The polish is rubbed over 2-3 square feet at a time, allowed to dry only a few seconds, then rubbed to a hard finish. If too much of the solvent is allowed to evaporate after the material is spread over the surface, the wax will be very hard to rub up evenly into the thin film which should remain on the car. A damp cloth is often used for spreading the polish, as this makes it somewhat easier to work with. The final polishing is with a clean dry cloth.

Since the number of new cars built for civilian use during the war period will be extremely limited even if not zero, it seems important for automobile owners to keep their present cars in as good shape as possible. Replacement parts will be available, and probably refinishing service. How long the original finish will last all depends on the care given it. A good appearance should be possible indefinitely with proper attention.

CHEMICAL SPECIALTY COMPANY NEWS

Wartime Substitutes Raise Many Problems

INDUSTRY'S problem of developing wartime substitutes is vastly more complicated than merely finding some synthetic, Charles P. Gulick, president and chairman of the board of National Oil Products Company, chemical manufacturers, pointed out in a recent interview at the firm's main plant in Harrison, N. J.

"Synthetics have been so satisfactory in many instances, that there has been a tendency on the part of laymen to believe that they provide a ready answer to every problem of shortages," Mr. Gulick contended. "The procedure, however, is much more involved than it appears to be.

"Finding of a substitute material, either in the world of nature or in the laboratory, is only the first step toward solution of the problem," he continued. "Processing of this new material is the second step. In all likelihood it may react somewhat differently from the original substance, especially if it is used in chemical combination.

May Be Weaker

"It may, for example, be weaker than the original, so that a larger amount will have to be used to achieve the same effect, but these larger amounts may upset the delicate chemical balance of the compound and so make the finished product unsatisfactory. Constant experiments in the laboratory are necessary to iron out such difficulties.

"The third step is the manufacture of the substitute product. Perhaps the machinery that turned out the original will have to be altered, or even scrapped, in the making of the substitute because of the different nature of the substances employed. It may even be necessary to devise new types of machinery needed.

"The fourth and final step in the marketing of a substitute is to teach its purchasers how it should be used. Its chemical or physical nature may be markedly different from that of the original."

According to Mr. Gulick, the war has intensified rather than curtailed his company's laboratory work. There can be no let-up in the research, because almost every day some commodity hitherto procurable goes on the priorities list and becomes unavailable for general use, he pointed out. The chemists may spend a long time before finally developing a new product as a substitute for an inaccessible product, only to have the newly-developed product itself withdrawn from the market. This puts the chemist in the awkward position of looking for a substitute for the substitute.

Higgins Gets New Wrapper

To complete the automatic filling, labeling, cartoning and packaging cycle for their ¾ oz. drawing ink bottles, the Higgins Ink Co., Inc, have just installed a package wrapping machine manufactured by the Packaging Machinery Co. The new machine takes six ¾ oz. cartons in two banks of three, wraps them securely and pastes an end label on each end of the package.

For years Higgins packed one dozen cartons in a display container. A survey proved that only a minimum of dealers used the container for its display value. Since a large color spot appears on each carton, most of the dealers prefer to display the merchandise by placing the cartons of different colors spectrumwise along a shelf in view of the customer. This makes a handsome display of the complete line, prevents pilfering and an assortment of colors is easily selected.

NAIDM Meets June 8 and 9

Twenty-eighth semi-annual meeting of the National Association of Insecticide and Disinfectant Manufacturers, Inc., was held at the Hotel Edgewater Beach, Chicago, June 8 and 9.

July issue of CHEMICAL INDUSTRIES will contain a complete report of what went on at the meeting, together with pictures of personalities who attended.

NOPCO 15-Year Club Gets 18 New Members

President Gulick pins medal on Perc S. Brown

Simple ceremonies, in keeping with the atmosphere of war-time bustle at the plant, marked the induction of 18 new members into the "NOPCO 15-Year-Club" by Charles P. Gulick, president and chairman of the board, of National Oil Products Company.

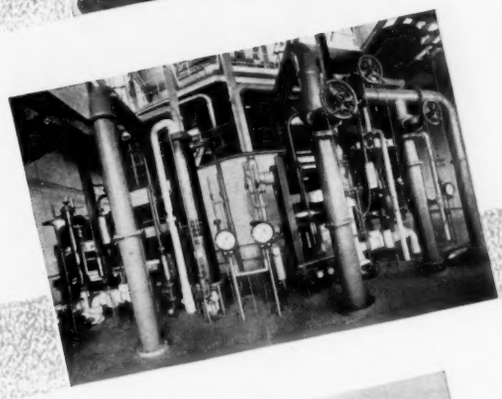
The 1942 Class was the largest ever inducted into the club, which is limited to employees who have been with the firm 15 years or more. The 18 new members swelled the total membership to 68.

In presenting solid gold emblems, bearing the company trade mark and the club's name, to each of the new members, Mr. Gulick emphasized America's great need in these trying times for the kind of loyalty, hard work and initiative displayed by members of the club.

The new members just inducted into the club included Perc S. Brown, vice president; Leslie M. Brown, A. Victor Jay, George H. Faux, Charles J. Kenlan, Frank E. Knab, William E. McGarry, James Bremner, Robert F. McClellan, Meyer Yablonsky, John Goeller, Nicholas Kasmiryk, Addison Wilson, Robert Jackson, Charlotte Williams and John Mobley. Two others, Miss N. O'Neill and L. D. Cook, who are employed in a company subsidiary, were unable to attend the ceremonies but were inducted "in absentia" by Mr. Gulick, who founded the company 34 years ago.

BADGER *Engineering*

BADGER *Equipment*



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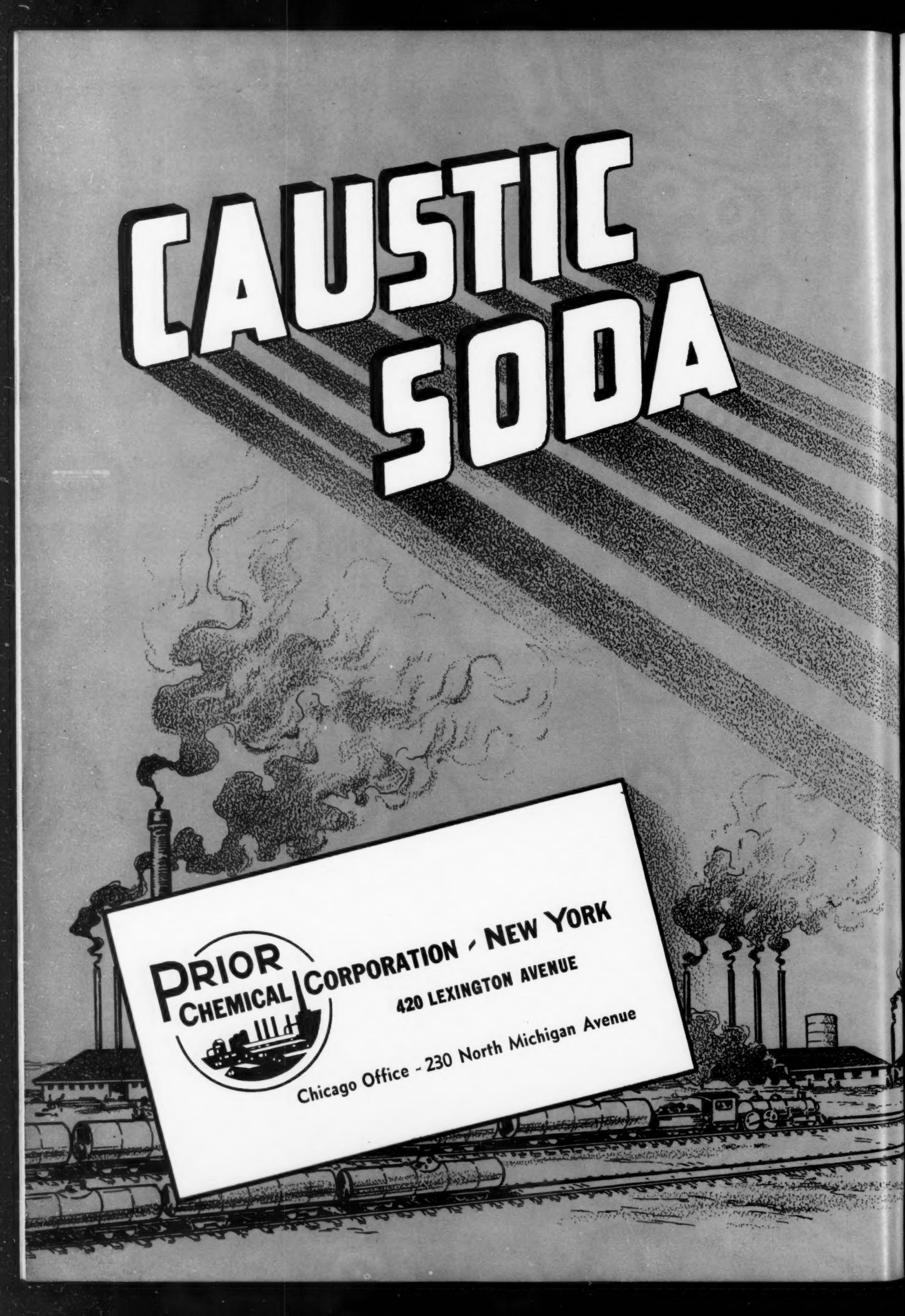
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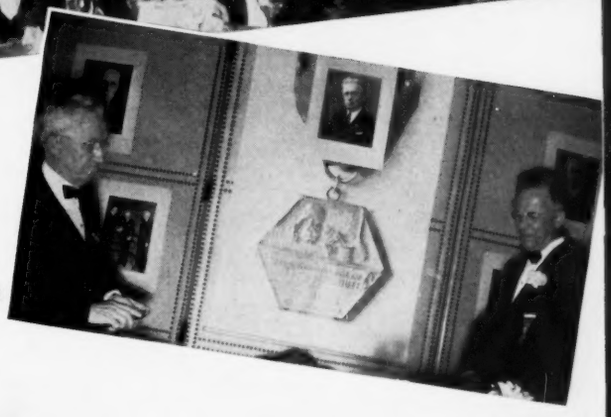
A. I. C. Holds Annual Meeting at Atlantic City, May 16

(1) Howard S. Nieman, Patent Attorney, and Secretary of the Institute; L. B. F. Raycroft, Vice-President, Electric Storage Battery; and Col. O. C. Wyman, U. S. A.

(2) Left to right, Dr. Gustav Egloff, Director of Research of Universal Oil Products, and the newly-elected President of the Institute; Walter J. Murphy, Editor of CHEMICAL INDUSTRIES, and National Treasurer; and Dean William T. Reed of Rutgers, and former Vice-President of the A. I. C. Speakers at the afternoon symposium on "The Chemist in War" included: Arthur B. Ray of Carbide; Gustav Egloff; Donald Price, National Oil Products, and Col. Wyman.



(3) Left, Prof. William Lloyd Evans, Professor Emeritus of Ohio State and recipient of the Institute Medal for 1942, and Dr. Harry L. Fisher of U. S. I., and retiring Institute President.

(4) H. B. Hass, Head of the Chemistry Department of Purdue, who spoke on the accomplishments of the Medalist, and Dr. Robert J. Moore of Bakelite and a former President of the Institute.

(5 & 6) E. H. Northey, chemist in charge of Pharmaceutical Research and Development of the Calco Division of Cyanamid, and Byron L. West of the Technical Committee of Calco.

(7) Dr. W. D. Turner, Columbia University, and Chairman of the Program Committee, and Frank O. Lundstrom, technologist with the U. S. Government, Washington, D. C.

Below, banquet scene.

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Chemists' Club Members Play Off Season's First Golf Tournament

Sixty-four members and guests participated in the Chemists' Club's first golf outing of the season at Bonnie Briar Country Club, May 21. H. R. Wemple won first prize for members low gross with a 78. Dr. R. F. Bacon, with an 84, took second. Members first low net prize was won by C. R. Dolmetsch, with R. E. Dorland taking second. A. L. Walker Jr. won the guests low gross and Charles Alexander took the guests low net prize. Eighty-four attended the dinner. CI's roving photographer took these shots at random.

(1) Left to right, R. E. Demmon, vice-president, Stauffer; R. H. Giebel, vice-president, Harshaw; H. F. Bowen, president, Bowen Fire-Proofing Co.; T. A. Haschke, salesmanager, Stauffer. (2) William B. Kuntz; H. B. Prior, Prior Chemical; Marx Hirsch; Dr. R. F. Bacon. (3) Ralph E. (Doc) Dorland, Dow Chemical, gets off a long one on the first tee. (4) Alexander Leith Jr., Dow, sizes up a putt. (5) E. E. Routh, Mathieson, gets ready for a long drive on the 10th tee. (6) Dave Jackson, Croll-Reynolds, sinks a putt while his boss, P. E. Reynolds, waits for his turn. (7) Blythe Reynolds, Heyden Chemical, waits patiently for the same reason. (8) Ira Vandewater, R. W. Greeff, in action on the putting green. (9) Looking from the clubhouse to the 18th green and the fairway beyond. (10) W. J. Kramer, Philipp Bros., tees off. (11) Kenneth Klipstein, Calco, drives a long one. (12) Dr. Joseph Ebert, Farastan Co., socks it on the first tee. (13) James E. Ferris, Niagara Alkali, hit this one hard and straight. (14) Dr. Philip Bowman, Heyden Chemical, hooked this one on the 10th. (15) J. S. Whittington, F. W. Berk & Co., got off a good one on the 10th. (16) C. R. Dolmetsch tees off to win the Carleton Ellis trophy. (17) C. A. Funke, Nova Chemical Corp., gets off to a good start on the first hole.

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SHARPLES

NORMAL BUTYL CHLORIDE

SPECIFICATIONS

Color	Water White
Sp. Grav. at 20°/20°C.	0.88—0.89
Water content	None
Acidity as HCl	Not over 0.01%
Distillation	
Not less than 95%	Between 76.0°—79.5°C.
Not more than 25%	Below 77.5°C.

OTHER PROPERTIES

Average Wt. per Gallon	7.37 lbs.
*Boiling Point	78°C.
Flash Point (Open Cup)	20°F.
*Melting Point	−123.1°C.
*Refractive Index	1.4015
*Latent Heat of Vaporization at 76.5°C.	79.8 cal./gm.
*Specific Heat at 20°C.	0.451 cal./gm.
*Surface Tension at 20°C.	23.66 dynes/cm.
Solubility in:	
Water	Negligible
Alcohol	Soluble
Ether	Soluble
Benzene	Soluble

*—Literature Values for Pure n-Butyl Chloride

Normal Butyl Chloride can be used as an alkylating agent, especially for the production of mixed alkyl or aryl derivatives such as those obtained by reacting with aniline, naphthylamines, and other organic amines. Many other syntheses are possible, a few examples of which are the preparation of butyl cellulose, butyl mercaptan, butyl polysulfides, mixed ethers and butyl benzene.

Sharples will welcome opportunities to consider the manufacture of intermediates or finished products involving Normal Butyl Chloride as one of the starting materials.

A sample and the complete price schedule of Normal Butyl Chloride will be sent on request.

SHARPLES TRADE MARK CHEMICALS

SHARPLES CHEMICALS INC.

PHILADELPHIA • • CHICAGO • • NEW YORK

Purchasing Agents Discuss the War at Waldorf-Astoria

The National Association of Purchasing Agents held its 27th annual international convention and "Inform-A-Show" at the Waldorf-Astoria Hotel, N. Y. City, May 25, 26 and 27 with an unexpected attendance of 2,400. (See page 819 for a report of what happened at the meetings.) CI sent its roving photographer to get some pictures of chemical personalities at the meeting. Most of these shots were taken at the Monday luncheon of the Chemical and Allied Products Buyers Group at which E. J. Parent, chairman of the group, general purchasing agent for Mathieson introduced Williams Haynes, former editor and publisher of CI, as guest speaker.

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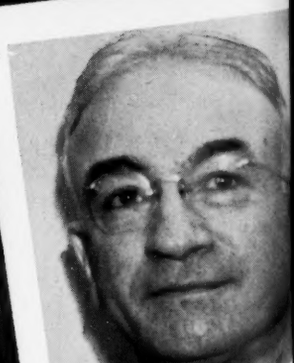

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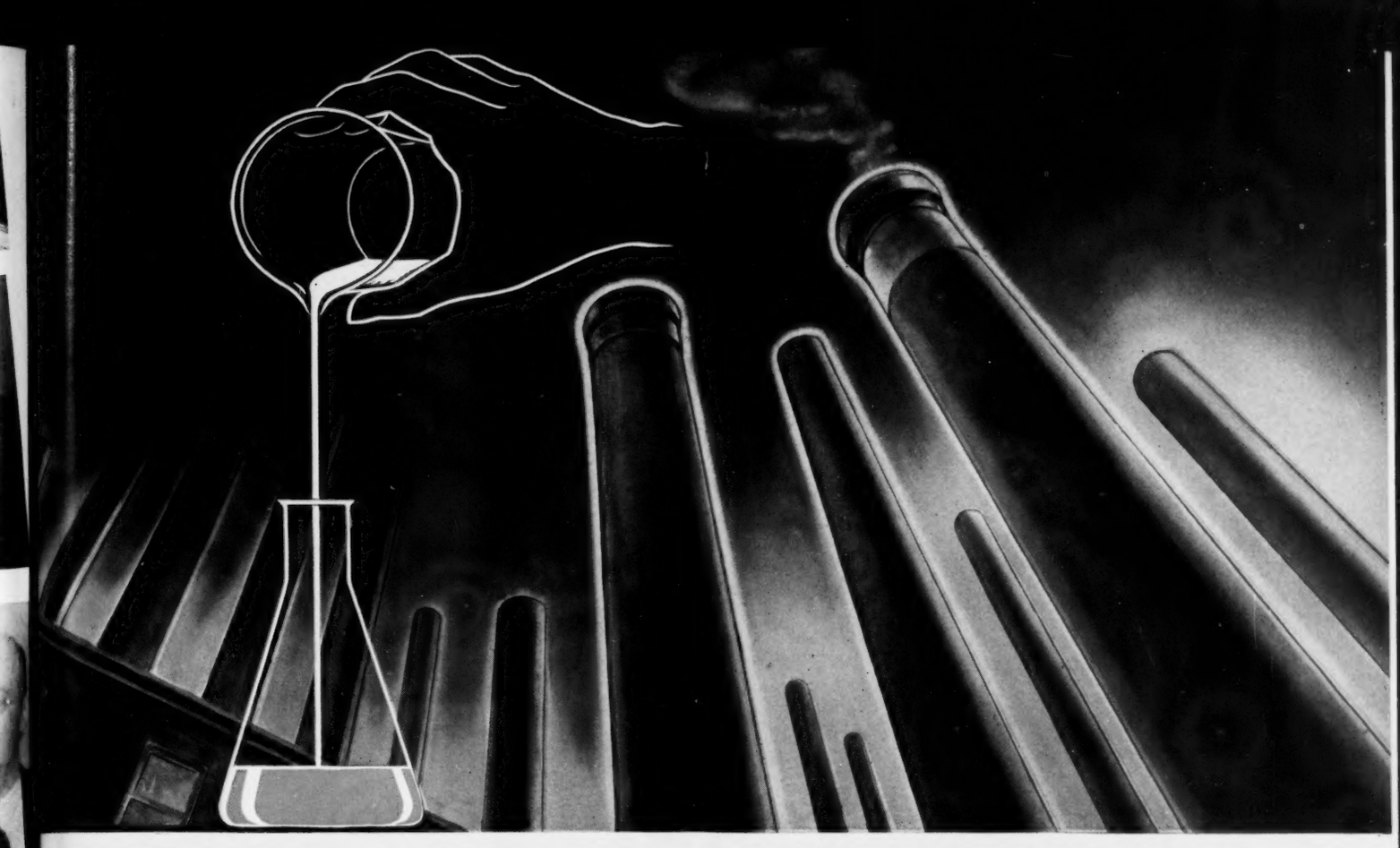
(3) Joseph N. Lubit, Flash Chemical Co. and E. B. Botsford, A. C. Lawrence Leather. (4) T. I. Savage, Murphy Paint and Varnish. (5) Benjamin Baylis, Purchasing Agent, Rumford Chemical Works. (6) E. C. Hamm, Signode Steel Strapping Co. (7) W. P. Harrington, Southern Alkali Corp. (8) R. J. Quinn, Mathieson Alkali. (9) J. H. Ewing, Calco, (new chairman of the Chemical and Allied Products Buyers Group). (10) E. J. Parent, Mathieson, retiring chairman of the Group. (11) Edward F. Heekin, Druckett Co. (12) H. P. Whipple, Hercules Powder. (13) William Atkinson, Jos. Pfizer & Co. (14) William D. Starr, Lea Mfg. Co. (15) Jack Henry, Joseph Turner & Co. (16) Earle W. Couch, Lea Mfg. Co.



Baker OFFERS HIGH PURITY CHEMICALS —TONNAGE PRODUCING CAPACITY

. . . as war brings many new problems to former peace-time chemists

Today—most chemists are really *two* chemists in *one.*

Peace-time chemists are engaged in new fields, confronted with new problems.

Theirs is emergency work—and their need for tonnage chemicals of exacting specifications is more urgent than ever. More than that, these chemists want to be sure that such chemicals are readily available at all times.

It has been the privilege of the J. T. Baker Chemical Co.—in peace-time and now in war-time —to supply industry with tonnage chemicals of unusual purity.

We invite you to call upon Baker . . . and to rely upon Baker as a reliable source of supply. It may be that, in certain industries, some companies now making their own tonnage chemicals would like to free their plants of marginal operation.

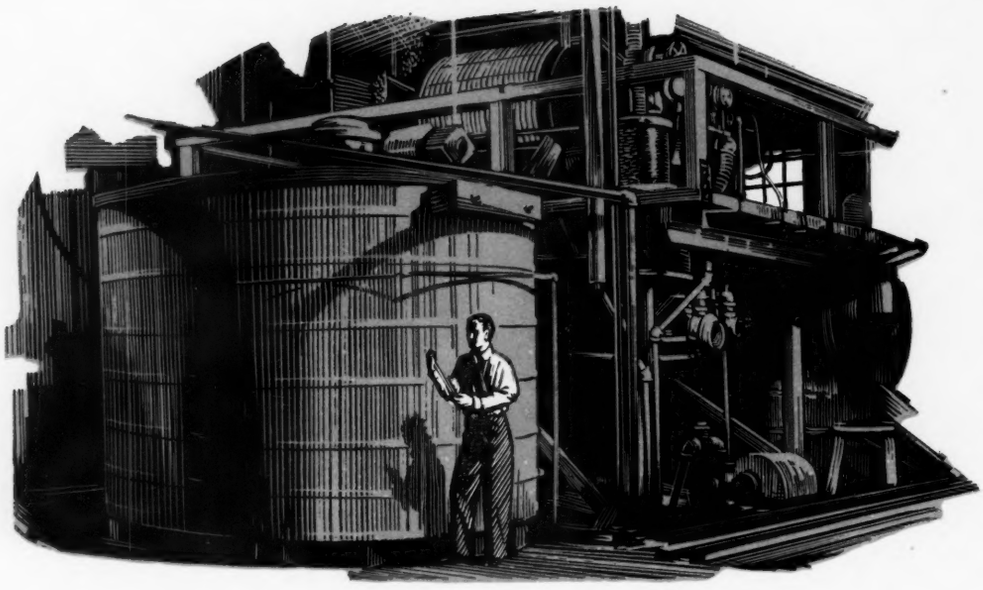
Baker will gladly contribute the combined knowledge of its Technical, Executive and Manufacturing staffs to meet any war-time problem.

J. T. Baker Chemical Co. ***Executive Offices and Plant:*** **Phillipsburg, N.J.** ***Branch Offices:*** **New York, Philadelphia and Chicago.**

Baker's

INDUSTRIAL CHEMICALS

You Get a Crystal Clear Solution



when you use Mallinckrodt

POTASSIUM META-BISULFITE

Its exceptional purity and high assay make Mallinckrodt Potassium Meta-Bisulfite the ideal sterilizing agent for use by brewers and wine makers. It is readily and clearly soluble in water, and is free from all objectionable impurities.

Mallinckrodt Potassium Meta-Bisulfite is also well adapted for a number of other important uses...in photography, photoengraving and lithography...in the processing of foods and beverages... as a scouring and bleaching agent in the manufacture of textiles and straw products.

Quotations and Details Furnished On Request

MALLINCKRODT CHEMICAL WORKS

FINE CHEMICALS Mallinckrodt SINCE 1867

Mallinckrodt Street, St. Louis, Mo. — **74 Gold Street, New York, N. Y.**

Chicago **Philadelphia** **Los Angeles** **Montreal**

75 YEARS OF SERVICE TO CHEMICAL USERS

NEWS OF THE MONTH

"Waste Is Treason," Nelson Tells Purchasing Agents

PURCHASING agents—2,400 of them—gathered at the Waldorf-Astoria Hotel, N. Y. City, May 25 to 27, for the 27th Annual International Convention and "Inform-a-Show" of their National Association to learn about "Purchasing's Part in Victory."

On the first day of the convention they heard Donald M. Nelson, chief of the War Production Board, voice a warning to the American people that waste is treason. He called for a campaign to save and salvage every scrap of critical materials. War production is coming along better than was expected, he said, and will be limited only by the scarcity of vital materials.

"Not only must we produce more each month than the Axis but we must make up the reserve which Japan has been building up since 1930 and Germany since 1933," he said.

"No matter how much we do today, we must do more tomorrow," Mr. Nelson declared. "Don't get over-optimistic or over-pessimistic. We will win this war, if we expect a long war and plan for it."

F. Albert Hayes, president of the N. A. P. A., officiated at the meeting.

At a luncheon meeting Monday of the Chemical and Allied Products Buyers' Group, Williams Haynes, former editor of CHEMICAL INDUSTRIES, spoke on "The Silver Lining to Substitutes."

A message of greetings to George A. Renard, secretary-treasurer of the association, from President Roosevelt was read at the first session.

"Donald Nelson and Leon Henderson, who are to address your members, will, I know, outline the part the government expects them to take in the war program," the President wrote. "As a body and as individuals you are today confronted with many new problems. You have had to meet many difficulties growing out of the conversion which military needs have forced upon industry. Your response has been encouraging.

"Other adjustments will have to be made. Many of you will have to exercise intelligence and ingenuity to a high degree in order to make available every possible facility for our armed forces. This, I feel confident, you will do."

The day's speakers, with the exception of Mayor La Guardia and Walter D. Fuller, chairman of the board of the National Association of Manufacturers, were war agency officials. The tenor of all the talks was similar—the war supersedes everything else; nonessential consumer goods will be out by the end of the year; very few appeals will be entertained from curtailment or limitation orders and more and more controls are in the offing.

Repeatedly emphasizing the importance of materials, Mr. Nelson said that the United States was the custodian of most of the scarce materials of the world and out of that meager store we must supply our Allies.

Peak Production Needed

"We have to build the biggest production program any nation has ever undertaken," he declared. "You can look at it and say it is impossible. But it has to be done and it will be done."

In April, he continued, war spending was at the rate of $41,000,000,000 annually and this month it has jumped to $47,000,000,000. Each month it will be increased unti it reaches a $60,000,000,000 rate by Fall.

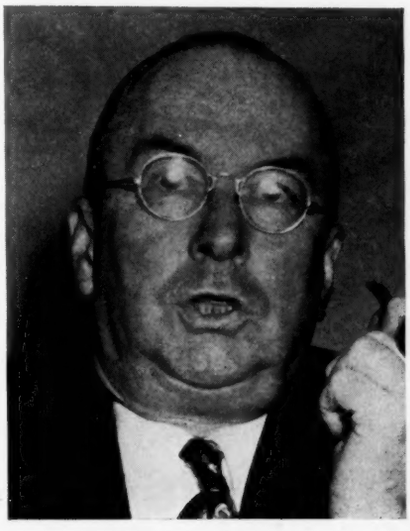
"Before the end of the year," Mr. Nelson predicted, "nothing will be produced that is not essential to the war or civilian economy."

Mr. Nelson warned that you can't be certain in a war and that things can happen to turn the tide the other way.

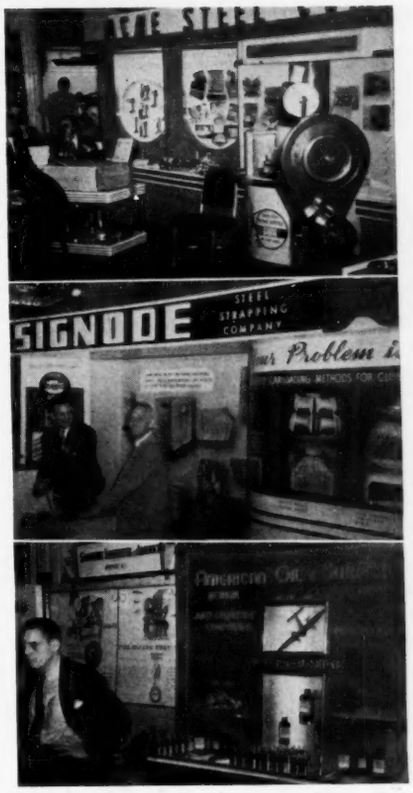
"We must keep on saving," he repeated. "We must be smart. This is a smart man's war. We are up against smart, ruthless, determined enemies who must win the gamble they are taking."

Afternoon session was a forum on priorities, inventories, allocations and the production requirements plan at which government officials from the War Production Board answered questions. Frederick J. Heaslip, Fairbanks, Morse & Co., was chairman.

WPB Chief Nelson



"Waste is Treason"



Above, three of the booths at the "Inform-a-Show." Acme Steel, Signode Steel Strapping Co., and American Oil and Supply were among the many companies exhibiting. Photos by CI's roving photographer.

Tuesday sessions were devoted to purchasing problems and Wednesday was Price Administration and Rationing day with Leon Henderson as featured speaker.

GENERAL

Student Applications High

Despite the opportunity for immediate employment at high salaries, the number of applicants for admission to the Cooper Union Engineering School is greater than a year ago, Professor Walter S. Watson, Director of Admissions, announces.

Reflecting the current demand for designers and draftsmen, a majority of the prospective students have designated mechanical engineering as the course of study they intend to follow, Professor Watson reports. Electrical, chemical, and civil engineering follow in that order among the choice of studies.

Because of the critical manpower shortage in war industries, the day engineering program has been intensified to cover three semesters of work in twelve months. Day engineering classes will begin on July 6, following the entrance examinations given from June 22 to 25. For the first time since Cooper Union was established in 1859, there will be no

day freshman engineering class admitted in the Fall.

The speed-up course, which has been accredited by the U. S. Navy for V-1 training leading to commissioning as ensigns in the Naval Reserve, begins on July 6. A similar program is expected to be started soon by the Army for training of its reserve officers and air corps personnel.

Since the accelerated course of study will not be given in the evening, freshman classes in art and engineering will be admitted in the Fall. Application for evening study in engineering may be made until August 10. Entrance examinations are scheduled to begin about a week later.

Researchers Invaluable

The 2300 industrial research laboratories in this country provide an invaluable reservoir of ideas, organized scientific knowledge, and special facilities for the solution of the many new technical problems growing out of the war effort. This fact was given particular emphasis at the recent Fourth Annual Meeting of the Industrial Research Institute in Cleveland, Ohio, Friday and Saturday, May 22 and 23, with headquarters at the Hotel Statler. Over 50 industrial executives and research directors participated in roundtable discussions which dealt chiefly with the adjustment of research programs and personnel to meet war conditions.

Co-operative Research Begins

A newly-formed group, the Co-operative Research Council,—sponsored by the American Petroleum Institute and the Society of Automotive Engineers—is now at work seeking the best combinations of fuels, lubricants, and equipment powered by internal-combustion engines. This council will continue the work of the Co-operative Fuel Research Committee which has functioned for the past 21 years.

Scores Rubber Technologists

America's acute shortage of rubber must be laid to rubber technologists who have failed to develop practical methods of separating this vital material from plants growing plentifully in our own country, Dr. Thomas Midgley, Jr., vice president of the Ethyl Gasoline Corporation, declared at a meeting of the Chicago Section of the American Chemical Society last month, when he received the Willard Gibbs Medal, one of the highest honors in American science.

More rubber can probably be grown within the United States than could possibly be consumed, but rubber production is confined to the tropics because of the ease with which it can be obtained from the hevea tree by cheap labor, said Dr. Midgley, who was cited for his discovery of tetraethyl lead as an anti-knock agent in motor fuels, for his development of safe refrigerants, for his contribution to synthetic rubber research, and for other scientific achievements.

Cash for Your Old Paint Brushes

Devoe and Raynolds Co. started this month a nation-wide campaign for collection of old paint-hardened brushes accumulated throughout the country. More than 10,000 dealers are co-operating and are authorized to pay from 10 cents to two dollars for the old things. Shortage of pig bristle normally imported from the Far East has necessitated the move. Above collection is being made at a New York store.

COMPANIES

General Aniline at War

Under the new management of General Aniline & Film Corp., appointed about three months ago by the Alien Property Custodian and the Treasury Department, a complete reorganization of the company's affairs has been effected and its operations largely converted to war production.

The company's Ansco camera plant, heretofore engaged in the production of cameras, is now almost wholly given over to the manufacture of sextants, fuses, airplane parts and other war material. According to Albert E. Marshall, Vice President, who is directing Ansco's activities, production will steadily be expanded to handle existing war contracts, and working personnel will be doubled.

An important item in the company's Ansco operations is the manufacture of the Ozalid machine for the speedy reproduction to scale of engineering drawings and other records. Output of these machines is now going largely to the Government and to the engineering departments of airplane and tank plants and other armament concerns. Thomas E. Brittingham, Jr. is directing the Ozalid operations.

General Aniline & Film has dye-making plants in New York, and New Jersey. Most of its products are now entering into the production of dyes used in the manufacture of uniform cloth, tent cloth and other textiles required by the Army and the Navy.

General Aniline & Film is also a large producer of one of the compounds entering into the production of tetryl, a prime military explosive. The company is the largest producer among the United Nations of carbonyl iron powder, of vital importance in the manufacture of wired and wireless communication apparatus.

Pfizer to Finance

Chas. Pfizer & Co., Inc., established in 1849, has completed plans to do the first public financing in its history, George A. Anderson, president of the company, announced last month. Ownership of the company up to this time has been confined to employees.

Program calls for recapitalization of the company and sale of more than $5,000,000 of new common stock. Out of the proceeds the company plans to retire all bank debt and preferred stock, to add more than $1,000,000 to working capital, and to purchase and retire the old common stock holdings of the estate of Emile Pfizer, son of the founder of the company.

Reichhold Gets Navy "E"

Reichhold Chemicals, Inc., Detroit, Mich., was awarded a Navy "E" pennant last month in public recognition of excellence in industrial production of materials which are vital to the nation's war effort. Ceremonies for the official presentation will take place June 24.

So Does Farrel-Birmingham

In recognition of excellence in the production of gear drives for Navy ships, the three plants of the Farrel-Birmingham Company, Inc. at Ansonia and Derby, Conn. and Buffalo, N. Y., have been awarded the "E," traditional Navy symbol for a job well done.

Bausch & Lomb, Too!

An All-Navy "E" Burgee with star went to the Bausch & Lomb Optical Company last month in recognition of its outstanding record in Naval Ordnance production.

New Quaker Warehouse

New and larger warehouse and blending plant facilities have been established by Quaker Chemical Products Corp. in Chicago. R. L. Phillips is plant manager of the new branch which is located at 9243 Baltimore Ave. K. B. Copeland and C. O. Judd are on the technical staff.

Change White Tar Name

The White Tar Co. of N. J., Inc., a wholly owned subsidiary of Koppers Co., has been absorbed by the parent company and is now called Koppers Company, White Tar division.

Operations will not be affected by the change in name.

New Durez Plant

Contract for design and construction of a chemical plant, to cost in excess of $3,000,000, has been awarded to The Rust Engineering Co., Pittsburgh, Pa., by Wheatfield Chemical Division, Durez Plastics and Chemicals, Inc. The plant will be located in New York State.

Paint Company Moves

Devoe & Raynolds Company, Inc., manufacturers of paints and brushes, announces the transfer of its brush division to larger quarters at 220 East 42nd Street, N. Y. City.

New Northwest Building

Northwest Chemical Co., Detroit, Mich., recently purchased a new and larger building equipped with modern manufacturing and laboratory facilities. New address is 9310 Roselawn Ave.

Camphor in "Priorities"

The breaking of the Japanese monopoly on camphor is the theme of the June number of Priorities, house magazine of Prior Chemical Corp.

ASSOCIATIONS

Salvage Conference Set

A conference devoted to problems of industrial salvage that will bring together all sections of industry, whether directly or indirectly in war production, will be held in N. Y. City at the Hotel Astor on June 17. The meeting is being held under the auspices of the American Management Association at the request of the War Production Board.

The purpose of the sessions will be to ascertain specific measures for the salvage of such critical materials as rubber, ferrous and non-ferrous metals, plastics, solvents and all other materials in ordinary use in war plants. Out of the discussions are expected to come plans that will form the basis of definite salvage

Announcing

TORITE

Synthetic Resin Plasticizers

for the

PAINT **VARNISH** **RUBBER**

INDUSTRIES

Available NOW for Immediate Shipment

We are in position to serve those industries which must have resins—synthetic, if not natural. Industries such as those making paints, varnishes, lacquers, rubber, etc., will find in the TORITE line of synthetics worthy alternates.

Our technical services are at your disposal. Inquiries invited.

MORNINGSTAR-NICOL, INC.

630 West 51st Street **New York City**

Established 1851

programs for all industries. The conference will feature case stories of how successful campaigns have been organized and executed. These case stories will illustrate principles that can be applied to any type of industry and any size company.

Gas Standards Fixed

Standards governing the installation and operation of gas systems for cutting and welding and also those for foam and carbon-dioxide fire-extinguishing systems were revised by the National Fire Protection Association at its 46th annual meeting held in Atlantic City, N. J., last month.

The gas cutting and welding standards were revised as a result of the number of serious fires that have been caused recently by the careless use of this type of equipment.

The fire-extinguisher system standards were revised in order to cover the new developments in this equipment.

Salesmen Play Golf

First golf tournament of the Salesmen's Association of the American Chemical Industry was held June 2 at the Garden City Country Club, Garden City, L. I. Charles Alexander, Seldner & Enequist, took first prize for low gross. (For full page of pictures see our July issue.) Next tournament will be held July 14 at Bonnie Briar Country Club, Larchmont, N. Y.

Missouri Group Golfs

Associated Drug and Chemical Industries of Missouri held its first monthly golf party at Sunset Country Club in St. Louis last month. Prizes were awarded to:

F. A. Barada, Fritzsche Brothers, Inc.; W. R. Mendenhall, Eli Lilly Co.; Ed Cunningham, Monsanto Chemical Co.; R. J. Richardson, Jr., Radio Station KWK; L. M. Shaneman, Penn. Salt Mfg. Co.; and Ray F. Caulk, Monsanto Chemical Co.

BIMS Tourney Tough

BIMS of New York opened the 1942 golf season on May 14 at the Baltusrol Golf Club, Springfield, N. J. Under the direction of Martin Schultes of Hewitt Soap, BIMS chairman, 125 members and guests in the soap, cosmetic, drug, perfuming materials and allied trades battled over the Baltusrol fairways and rough, mostly rough. All prizes were in the form of war bonds and stamps instead of the usual prizes. The next BIMS good fellowship golf tournament will be at Winged Foot Golf Club, Mamaroneck, N. Y., on Tuesday, June 23.

Newton Heads Loop ACS

Dr. Roy C. Newton, vice-president in charge of research laboratories, Swift & Co., was recently elected president of the Chicago Section of the American Chemical Society. He assumes office July 1.

Philly Paint Club Meets

At the May meeting of the Philadelphia Paint and Varnish Production Club. Dr. Schwarcman, research director of Spencer Kellogg, spoke on the difference and close relationship of the fatty acids in our present drying oils and the need for more academic research in oil.

CDIC Holds Golf Meet

Annual golf meeting of the Cincinnati, Dayton, Indianapolis, Columbus Paint and Varnish Production Club was held June 8 at the Columbus Country Club. Cincinnati Paint, Varnish and Lacquer Association members were guest participants.

Trigg to Be Honored

Philadelphia Paint, Varnish & Lacquer Association will honor Ernest T. Trigg, president of the national association, at a dinner June 30th in commemoration of his 50th anniversary in the field.

NY Club Outing June 6

New York Paint and Varnish Production Club held its annual outing June 6 at the Mountain View Golf Club, New City, N. Y.

Chicago Club Picnic Aug. 15

Chicago Paint and Varnish Production Club will hold its annual golf picnic August 15 at the Nordic Golf Club.

PERSONNEL

Three Get Fellowships

Fellowships to carry on their investigations at the Westinghouse Research Laboratories have been awarded to: Dr. Russell E. Fox, University of Virginia; Dr. Gerson S. Schaffel, Carnegie Institute of Technology; and Dr. Robert S. Weisz, Cornell University. Comprising the fifth group selected under the Westinghouse Research Fellowship plan inaugurated in 1938, they will carry out original research on scientific problems of their own choosing.

Melchett Medal to Fieldner

The Melchett medal, awarded annually by the Institute of Fuel of England, for outstanding achievement in work involving the scientific preparation or use of fuel, will be presented this year to

It's Bicycles Now at Westinghouse

Engineers at Westinghouse Research Laboratories, now engaged 95% on war research, have organized a bicycle brigade to conserve tires and gasoline. Try it yourself.

An activated aid to processing **DARCO** REG. U.S. PAT. OFF. *An active aid for purity specifications*

Why We Never Urge You to

"WRITE FOR OUR CATALOG"

The reason is — *Darco has no catalog.*

We make activated carbons in several grades for different types of purification. But until we learn what you want to purify, and what kinds of impurities you want to remove — we can't tell you which grade will give best results. Each application is a problem in itself—deserving and getting individual attention.

In other words, instead of cataloguing the virtues of our product, we start with your product's requirements and work out the problem from there.

If you are having troubles with color, odor, or taste specifications in your finished product—or if you want to investigate the possibilities of cutting production costs in purifying process liquids with activated carbon—ask your technical staff to get in touch directly with the Darco representative. You'll find him a competent purification specialist —ready and able to give the help you want.

DARCO Reg. U. S. Pat. Off.

DARCO

DARCO CORPORATION

60 East 42nd Street, New York, N. Y.

Dr. Arno C. Fieldner, Chief of the Technologic Branch and Chief of the Coal Division, Bureau of Mines.

Price on ACS Committee

Dr. Donald Price, technical director of the Organic Research Laboratories at the National Oil Products Company plant in Harrison, N. J., has been elected to the Executive Committee of the American Section of the Society of Chemical Industry.

Barth Joins NOPCO

E. J. Barth, petroleum technologist, of Three Rivers, Texas, has just joined the Research and Development staff of National Oil Products Company, Harrison, N. J.

Barth, who is a graduate of Columbia University, has several patents to his credit in the field of chemistry.

Grasselli Resigns

T. S. Grasselli, vice-president and a member of the board of directors of E. I. du Pont de Nemours & Co., resigned from the company May 31 because of ill health.

Mr. Grasselli has devoted his business life to the chemical industry which he entered in 1893. He joined the Grasselli Chemical Co. in Cleveland, founded by his grandfather in 1839, and served in all departments until 1916, when he was elected president. After the merger of Grasselli with DuPont in 1929, he became a director of the latter company and continued as president of the Grasselli organization. He was elected a vice president of DuPont in 1936 and served as a member of the executive committee for several years. He retired from active work on Nov. 14, 1939.

War Bond Appointees

Harry M. Shackelford, vice-president of Johns-Manville Co., will be executive secretary to **John T. Madden,** the chairman of the U. S. Treasury War Bond Pledge Campaign for Greater New York.

Leverone Retires

Louis E. Leverone retired this month as general manager of Stein, Hall & Co., Inc. and Stein, Hall Mfg. Co., Chicago, after an association of 30 years with the company. He will continue as a vice-president of the company but will devote most of his time to civic and other duties. **D. M. Hawley,** production manager, has been elected general manager and vice-president.

Egloff Speaks on Oil

Dr. Gustav Egloff, director of research, Universal Oil Products Co., and one of the country's foremost experts on petroleum technology, addressed the May 14 meeting of the New York Section of the American Institute of Chemical Engineers at the Chemists' Club, N. Y. City. His topic was "The Modern Petroleum Industry," with particular reference to the problems presented by the war effort.

Engel With CWS

Robert A. Engel, manager of the industrial chemical department, Givaudan-Delawanna, Inc., N. Y. City, has resigned his position to go with the U. S. Army Chemical Warfare Service Planning Division in the New York office.

New Pfaudler Directors

Board of Directors of the Pfaudler Co. last month elected to membership **George F. Kroha,** vice-president and general sales manager, and **George C. Calvert,** vice-president in charge of the Elyria, O., plant.

GE Appointments

C. F. Pittman, manager of the motor division of General Electric's industrial department, has been named assistant to the manager of the industrial department. **W. H. Henry,** who was manager of sales in the motor division, succeeds him as manager of the division.

Faust on Society Board

Charles L. Faust, chemical engineer, Battelle Memorial Institute, Columbus, O., has been named to a five-year term on the board of managers of the Electrochemical Society, an international group of industrial scientists.

Heikes Chief of Zinc Branch

George C. Heikes has been appointed Chief of the Zinc Branch, WPB, replacing David Uebelacker, who has been recalled by his firm, Ford, Bacon and Davis of New York.

Montenyohl Retires

V. I. Montenyohl, vice-president of the B. F. Goodrich Co. and a member of the organization for 35 years, has resigned because of his health.

Browne With Battelle

William H. Browne has been named a research engineer on the technical staff of Battelle Memorial Institute, Columbus, Ohio, where he has been assigned to the division of fuel research.

Johnson Promoted

William C. Johnson, sales manager of the crushing and cement division, Allis-Chalmers Manufacturing Co., has been named manager of the Allis-Chalmers general sales organization.

Howerton Promoted

R. D. Howerton has been appointed manager of the Chicago office of Calco Chemical Division, American Cyanamid Co.

O'Daniel Elected

E. V. O'Daniel, vice-president of American Cyanamid Co., has been elected a director of the Commerce and Industry Association of New York.

Price NFPA Head

Dr. David J. Price, chemical engineer of the Bureau of Agricultural Chemistry and Engineering, was elected president of the National Fire Protection Association in Atlantic City, May 14.

Lewitus Joins Merck

Victor Lewitus has joined Merck & Co., Inc., Manufacturing Chemists, as a writer in the advertising department. For the past four years Mr. Lewitus was associated with the promotional division of Hoffmann-LaRoche, Inc.

RESEARCH'S CONTRIBUTION TO THE WAR EFFORT

62 of a series of timely suggestions for solving war-time problems

You may find the answer to your problems in the following list: ADVERTISEMENT

Protect aluminum with new chemical against corrosion at low temperatures where condensation is possible. (111)

Metal castings, smooth and non-brittle, are now produced by a new foundry core application. (115)

Seal for joints and seams which is flexible, leak-proof, non-cracking and resistant to benzol, gasoline, diesel oil, butane, propane, pentane and similar liquids and gases. (119)

Lubricating compound for drawing aluminum. (139)

Lubricating compound for tin stamping which permits the stamping of lacquered metal without fracturing the coating. (140)

Rust prevention, lubrication and bright annealing of nickel alloy stampings are obtained by the application of a solution of a synthetic wax which gives a water resistant finish. On subsequently annealing the stamping, the wax has a reducing action on the oxides and gives a very bright anneal. (157)

Both ferrous and non-ferrous surfaces can be protected from tarnish and corrosion by means of a special emulsion which is sprayed cold onto the desired parts to give a thin, transparent adhesive film. (159)

Nickel alloys are now being drawn, stamped or formed and then annealed without cleaning by means of a special water dispersible wax-like synthetic. (177)

Sintered bearings made with metallic powders have a tendency to stick in the molds. A newly developed lubricant enables the bearings to be very readily released from the molds. (179)

A water soluble material that gives a soft, flexible, transparent film on paper, textiles, wood, etc. (112)

Waterproof cloth or paper in one operation. A new waterproofing liquid does it. (133)

Flameproofing agent cuts fire risks for textiles, paper, wood and composition board. (143)

Paper coated with paraffin wax is rendered much more translucent by a pretreatment with an aqueous solution of a new synthetic chemical. (145)

Non-stick wrapper for packaging sticky candies and other products made possible by new wax coating of white, odorless, synthetic wax in conjunction with paraffin wax. (156)

Olive oil substitute for textile and other technical lubrication. (128)

Textile lubricant which is water soluble. (137)

Cotton and rayon braid, shoe laces, etc., are treated with a combination of waxes to give increased flexibility and high lustre. (148)

Dye solvent for water insoluble dyes which makes them "soluble" in water. (149)

Textile emulsions of oils and waxes stable in the presence of sulfuric acid, aluminum sulfate and other electrolytes, can readily be made by use of a new type of emulsifying agent. (152)

"Nylon" and "Vinyon" lubricant can readily be made in the cold by use of synthetic emulsifying agent. The finished oil is readily removed by water, is non-oxidizing, stainless and will not carbonize. (167)

Textile oils used as worsted lubricants, spun rayon stock lubricants, finish and lustre oils for cotton, rayon and other natural and synthetic yarns can economically be made by means of a new synthetic oil, produced from domestic raw materials. (170)

A temporary binder for clays for ceramic insulation prior to firing, enabling the clays to be molded without crumbling. (113)

Porcelain, vitreous china, plated metal parts are protected against mechanical abuse and corrosion by a new type of protective coating. (123)

Binder for vitreous enamel to replace gum arabic for vitreous enamel designs, enabling identifications or trade-marks to be applied with a rubber stamp. (131)

Abrasive wheels. A temporary binder for abrasive wheels which completely volatilizes on firing. (141)

Porcelain enamel frit binder giving a firmer and more lustrous enamel coating than is obtained with gums. (142)

Adhesive for "cellophane," cellulose acetate and other synthetic materials of a similar nature. (118)

Adhesive for holding tissue paper to aluminum in special map and display work. (124)

The adhesion of rubber to cloth on vulcanization can be increased by the addition of a chemical material to the raw rubber mix. (151)

Thermosetting cements for lamp and radio tube bases of the alcoholic phenol formaldehyde type containing a synthetic product, made domestically, have greater thermoplastic effects before heat setting than when shellac is used. (164)

Pulp color and pigment dispersing agent for aqueous products that prevents caking. (120)

Flatting agent for paints and varnishes that eliminates grinding and produces a smooth, uniform product. (125)

Semi-gloss water emulsion paints and varnishes that are water resistant on drying are made with a protein base. (127)

Lacquer, varnish and enamel plasticizer which is light in color and which will increase the gloss of the dry film. Also has good wetting and dispersing properties for pigments. (144)

Lake colors which permit soft grinding, giving better length and dispersion, are obtained by the application of a glyceryl compound before coupling bases. (163)

Pigment lakes incorporated in the usual vehicles exhibit greater length and absence of "buttering" by the use of a special soaplike material applied in the acid phase in the manufacture of the lakes after coupling. (166)

Non-mar enamels are easily made by the incorporation of a solution of a special wax which gives increased "slip" effects. (169)

Lacquers giving excellent water and ink resistance are obtained by the incorporation of a solution of a new type of wax. (171)

Rubber goods finish of high lustre and flexibility resistant to gasoline. (129)

Raw rubber sheets can be prevented from sticking together by means of a water dispersion of a synthetic wax-like material. This dispersion can also be used as a lubricant in the cutting of rubber gaskets. (150)

Plastic and hard rubber articles can be polished by the tumbler barrel method by means of a hard, white, synthetic wax which effectively replaces carnauba wax at a much lower cost. (168)

Synthetic rubber can now be made flexible by means of a new plasticizer which is now available. (184)

Cork preservative to prevent mould formation. (132)

Cement, concrete and stucco waterproofing agent. (138)

Warpage of wood can be prevented by the use of a special wax which increases acid and alkali resistance as well as decreasing time of impregnation. (146)

Wood, fibreboard, etc., can be flameproofed effectively without loss of other properties. (176)

Sulfonated oils in the treatment of furs and leather can be replaced by the use of a new synthetic oil which eliminates rancidity and stickiness. (158)

Printing ink vehicles giving better spread, slip and anti-blocking effects are obtained by substituting for ozokerite a new synthetic wax made from domestic raw materials. (162)

Urea formaldehyde resins are plasticized and lubricated by new water dispersible waxes which are incorporated in the aqueous phase. (165)

Carnauba wax can be replaced as a lubricant for molding thermosetting plastics by a synthetic wax now available in powdered form. (172)

Wax which will not melt in boiling water. (110)

Substitutes for imported waxes such as Montan wax, Ozokerite, Japan wax, etc., now available. (114)

Synthetic oils dispersible in water that do not contain soap, or added emulsifiers. (121)

Emulsifying agent for emulsions stable in strong acids, salts and other electrolytes. (122)

Photographic offset plates are improved, giving increased water solubility, spread and wearability by the use of a new type of binder. (126)

Defoaming agent for casein, glue, gelatine, shellac and similar products. (130)

Wax which "dissolves" in hot water. (135)

Oil which remains fluid at —50° C. without freezing. (136)

Glycerin substitutes meeting specific requirements are now commercially available. (175)

Lanolin for industrial purposes can be replaced by a new compound made from domestic raw materials. (178)

A liquid foam producer to replace Saponin for industrial purposes is now being offered. (181)

A hygroscopic, water soluble liquid which is an excellent dye solvent and which replaces glycerin in many instances. (182)

See number in parenthesis after each subject. Jot down and mail to us any number that interests you. We will send you data sheets about the chemicals and their uses. Answers to many other problems in your industry are given in our 112 page manual "Chemicals by Glyco" —which is yours for the asking.

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Pechukas Succeeds Muskat

Alfonse Pechukas has been named Acting Director of Research of the Columbia Chemical Division of the Pittsburgh Plate Glass Company, succeeding **Dr. Irving E. Muskat** who has resigned.

Elliott With Battelle

Fred W. Elliott has been named a research engineer on the technical staff of Battelle Memorial Institute, Columbus, O., and has been assigned to the division of organic chemistry.

Post Promoted

Herschel E. Post has been appointed general sales manager, industrial finishes, Pittsburgh Plate Glass Co.

Chase With Battelle

Laurence H. Chase has been named a research engineer on the technical staff of Battelle Memorial Institute, Columbus, O. He has been assigned to the division of organic chemistry.

Sheldon With Union Bay

George G. Sheldon, formerly vice-president of the General Tire and Rubber Co. of Boston, has been appointed general sales manager of the Union Bay State Co., Cambridge, Mass.

Linz Succeeds Kissock

Arthur Linz succeeds Alan Kissock, Climax Molybdenum vice-president who was in charge of the company's conversion plant at Langeloth, Pa.

Reid With Battelle

Harry F. Reid, Jr., has been appointed a research engineer on the technical staff of Battelle Memorial Institute, Columbus, O., and has been assigned to ceramic research.

Marx Joins Milk Institute

Victor E. Marx has joined the staff of the American Dry Milk Institute, Inc., Chicago.

Supplies of nylon racket strings and fishing tackle adequate for a normal 1942 season already are on the shelves of sporting goods dealers, reports the Du Pont company.

Addinall Addresses Salesmen's Association

Dr. C. R. Addinall, Merck & Co., spoke on "The Importance of Vitamins in the World Today" at the May 19 dinner meeting of the Salesmen's Association of the American Chemical Industry. Photograph by CI. Dinner was held at the Chemists' Club, N. Y. City.

OBITUARIES

Arthur A. Backus

Arthur A. Backus, Vice-President in Charge of Production of U. S. Industrial Chemicals, Inc., was fatally injured on May 18th when he accidentally fell from a train enroute from his home in Stamford, Conn. to New York.

He was also a director of Stroock & Wittenberg Corporation, Cuba Distilling Company, Dominican Molasses Company, and Porto Rico Mercantile Company.

Austin Promoted

Hercules Powder Company announced June 1, the appointment of William J. Austin, manager of the Chicago office of Explosives Department, as director of purchases of the company. Mr. Austin succeeds Kurt W. Jappe, former director of purchases, who will become manager of Detonator Operations, Explosives Department.

He was a member of the American Chemical Society, American Institute of Chemical Engineers, Society of Chemical Industry, the Chemists' Club of New York, and the Uptown Club.

Cary D. Waters

Cary D. Waters, president of C. J. Tagliabue Mfg. Co., died May 9.

E. W. Weed

Edward W. Weed, director and retired president of the G. F. Harvey Co., N. Y. City, died May 24 at the age of 63.

Management Conference Held

Plant production managers in war industries throughout the U. S. met in New York, May 13 and 14, for the Spring Production Conference which took place at the Hotel Astor.

The sessions were devoted entirely to an exchange of experience in war-time production. Main emphasis of the discussion was placed upon such topics as: Organizing Companies for Conversion and Expansion; Organizing Executive Staffs for War Work; Finding Employee Replacements; Ideas for Lengthening the Life of Equipment; Getting Full Worker Cooperation on War Production; Production Control; Stimulating Plant Enthusiasm.

Metallizing Co. Moves

Metallizing Co. of America has moved its Chicago general offices and midwestern warehouse to 1330 West Congress St.

Free War Study Courses

To meet the shortage of trained personnel in fields essential to national defense, six intensive tuition-free courses will be given at Columbia University this summer. The courses, planned in cooperation with the United States Office of Education, are scheduled from June through August in daytime and evening sessions.

The studies, which will vary in length from two to fourteen weeks, will include training in defense aspects of engineering, science and management, and will range from instruction in basic subjects such as topographical and general map making to more advanced topics such as the chemistry of powder and explosives. Two courses have been particularly planned for women, in response to the demand for women workers in defense industries to replace men being drafted.

These special classes are among nearly 500 courses which have been added to the regular Summer Session curriculum at Columbia University this year to meet wartime needs in education.

Two of the courses are designed to prepare students for map making. One, in photogrammetry, will provide training in the principles of making maps from aerial photographs, the operation of stereoscopic machines, and related work. Instruction in topographic drafting will train draftsmen and tracers in map making for various government departments and agencies, particularly for service in the National Defense Mapping Program.

Persons planning to work in explosives and loading plants as inspectors for the Ordnance Department and operators for manufacturers having contracts in this field will be able to prepare for this work in a special class on the chemistry of powder and explosives. United States citizens with three years of college chemistry are eligible for this course.

An intensive two weeks' course on statistical chart construction will provide increased numbers of statistical draftsmen for service in the government agencies and in war industries.

Instruction in metallographic laboratory practice, which includes practice in the preparation of metal specimens for microscopic examination, and lectures and laboratory work in photomicrography, the science of taking an enlarged photograph of a microscopic object by attaching a camera to a microscope, are the courses open to women.

Williams Brothers Honored

Robert R. Williams, chemical director of the Bell Telephone Laboratories of New York, and Roger J. Williams, professor of chemistry in the University of Texas, received honorary degrees of Doctor of Science at the 188th Commencement of Columbia University on June 2.

Internationally known for their achievement in vitamin research, the Williams brothers were co-recipients of the Charles Frederick Chandler Medal awarded annually by the University for outstanding contributions to chemical science. The award ceremony took place last February.

In conferring the degrees, Dr. Nicholas Murray Butler, president of Columbia, cited Dr. Robert Williams for "early taking a leading part in research in various fields including submarine cable insulation as well as the structure and synthesis of the anti-neuritic vitamin" and for "a long record of accomplishment and distinction in an exceptionally helpful field of scientific inquiry."

Dr. Roger Williams was cited for "giving nearly twenty years of scientific service to two institutions in the state of Oregon; winning distinction by most important contributions in the field of biochemistry, particularly by research as to vitamins with results which have great importance in medical chemistry."

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CANADIAN REVIEW

By Kenneth R. Wilson

OTTAWA—One hundred and forty days after Pearl Harbor, President Roosevelt told the United States that wages must be stabilized as part of a seven-point drive against inflation.

Canada took its first major step towards wage-stabilization in December, 1940. By governmental order-in-council (not requiring ratification by Parliament) it set forth certain "principles" as the basis for settlement of wage disputes in war or essential industries. The program aimed to (1) put a ceiling on all wage RATES for the duration of the war; (2) to put a floor below which wage rates might not fall; (3) to provide payment of a cost-of-living bonus to protect the wage-earner's standard of living against a runaway inflationary rise in prices.

K. R. Wilson

Most important feature of the plan was the proposal for paying a cost-of-living bonus in lieu of higher wage rates. The bonus was geared to the official cost-of-living index and, in effect, called for payment of a weekly 25 cent bonus every time the index rose by one point. The bonus was based on the average pre-war industrial payroll of $25 a week. A one per cent rise in living costs being met by a one per cent (25 cent) increase in earnings.

The bonus idea was completely revolutionary. It was conceived by the government's No. 1 Economic Adviser, Dr. W. A. Mackintosh (on loan to the government from his peacetime job as head of the Economics Department at Queen's University, Kingston). It was first tried out by coal miners in Western Canada (United Mine Workers of District 18) who signed a somewhat similar agreement (voluntarily) in May, 1940. By this agreement (worked out by the mine union leaders themselves) wage rates were fixed at the then prevailing rates for the duration of the war and one year thereafter. Provision was made for payment of a flat rate bonus whenever the cost of living rose by five per cent or more.

In July, 1941, seven months after the original order-in-council, the Canadian government put real "teeth" in its wage stabilization program. Instead of being merely an "instruction" for guidance of war industry and the settlement of industrial wage disputes, bonus payments were made mandatory for all war industry. Steps were taken to definitely stabilize all war industry wage rates on the basis laid down in the original order-in-council.

The highest wage rates established between 1926 and December 16, 1940, were to be regarded as fair and reasonable; they might be restored (if necessary) and maintained, but not increased.

This was as far as the federal government felt it could go at that time because wage rates and working hours in non-war industry are normally matters of provincial concern and not strictly under federal control. The federal government did however seek the cooperation of provincial governments in extending the wage stabilization program to all industry with the implied threat that if this were not done, special power would be invoked under the War Measures Act.

Back in July, 1941, this program was looked on by many people as definitely inflationary in character, because it involved the payment of an immediate and costly "bonus" to a large part of Canada's industrial wage-earners. For example, railway unions gained the right to a substantial weekly bonus for all members. (The bonus was in lieu of a ten per cent increase in wage rates which would have become a permanent part of the transportation cost structure.)

This then is the background against which Canada, on November, 1941, froze all wage and salary payments for the duration as part of its price ceiling program. The "freezing" order came as a logical and ultimate result of the earlier stabilization program. In brief it provided:

(1) that except on permission of a National Labor Wage-Board no employer might increase the basic scale of wage rates above the effective rate on November 15, 1941. The board was given power to adjust any wage rate which was lower or higher than the rate generally pervailing for the same or similar occupations in the locality.

(Since it was appointed, the Board has received only 152 applications for adjustment; 96 had been disposed of by May 6, 1942, of which 61 permitted wage increases and 10 an increase or adjustment in cost of living bonuses.)

(2) A cost-of-living bonus payable to all employees other than those occupying positions above the rank of foremen or comparable ranks.

(The bonus is 25 cents a week for each 1 point rise in the official cost of living index but so far none have been paid. The reason is that Canada's price ceiling has kept the index from rising. The Index now stands at 115.9 compared with 115.5 in the "base" month of October, 1941.)

(3) Freezing of all salaries (including workers above the rank of foremen) as at November 6, 1941. No cost of living bonuses are required but they may be paid to salaried employees receiving less than $3,000 a year.

The next big job which Canada tackled on its wartime labor front was a nation-wide mobilization of industrial manpower. On March 24 of this year, the government named a 43-year old pulp and paper executive, Elliott M. Little (on loan from his peacetime job as general manager of Anglo-Canadian Pulp and Paper Co.), as director of National Selective Service. With his appointment came a sheaf of new orders-in-council which set up mobilization machinery and took three immediate important steps:

1. Created a list of 10 "restricted" occupations and 60 trades and industries which may no longer employ a man of military age and fitness without special permit.

2. Prevented any farm workers from moving into industrial employment. A man who was working on a farm on March 23 may move to another farm; may enlist in the armed services, or may take a seasonal job in a primary industry. He may not take other employment.

3. Created a technical "pool" embracing all professional engineers, scientists, chemists, architects, etc.

Employers of all such persons whose services are required for the war effort are henceforth obliged to release such men and reinstate them after the war. All transfers in this field must be made henceforth through a Technical Service Bureau. There is no compulsion placed on the man to move from his present job but if the man wishes to go and he is needed in a war industry his employer must release him.

These were the immediate results of a broad, comprehensive manpower mobilization program which may eventually control the employment of every wage-earner in Canada. With the one exception of farm labor there has been no attempt to "freeze" Canadians in their job but merely to set up machinery whereby, alongside a "running" inventory of manpower, the hiring and firing of all workers will eventually be channelled and recorded.

Director Elliott Little also believes that part of his job is the establishment

(*Continued on page 834*)

MARKETS IN REVIEW

By Paul B. Slawter, Jr.

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

THERE'S a publication called "War Production News" published by the War Production Board which comes into this office from the Regional Office, 122 East 42d St., N. Y. City. If you've got stuff you'd like to sell to the government and you haven't already got your name on the subscription list send for it right away. If you want to sell chemicals to the army or navy, here's your chance.

Some of the things listed under chemical and allied products, just to give you an idea, were: magnesium sulfate, liquid chlorine, lime hydrated, copper sulfate, nitrous oxide, oxygen, ethylene, carbon dioxide, acetylene, prest-o-lite, benzoin and iodine, fluid extract, chloroform, collodion, elixir, iron, quinine and strychnine, methyl salicylate, castor oil, paraldehyde, glycerine, paint, white lead, oil linseed boiled, turpentine, varnish, shellac, glue horn, cement, linoleum, beeswax and sailmaker.

Bids have closed for these products by this time but you'll do well to get your copy regularly and get your bid in on time. See your local WPB office *first*. It will save you time and expense!

Construction: In a move to make all possible material and effort available for immediate war production, top officials of the War Production Board and the War and Navy Departments have established broad principles governing all war time construction which will bring such building under more rigid conservation control.

The program means that no new plants will be built unless they are absolutely essential and can meet seven newly established criteria. This applies not only to direct war plants but to all other construction, both publicly and privately financed.

One of the main reasons for the new policy is that all critical materials are needed for war production now, and no materials can be spared for building new facilities except when they are absolutely necessary. The policy means simply that, in the light of existing shortages, it is necessary to put materials and effort into planes, ships, tanks and guns now, rather than putting them into plants which would not produce fighting weapons until a much later date.

Shipping: Following the recent executive order in which the President extended to several Government agencies the power to import war-essential materials duty-free, the War Production Board announced that, beginning July 1, it will take control of imports of all civilian commodities.

Under a previously issued order, the W. P. B. already exercises supervision over the import of strategic raw materials. The new order, however, is intended to give the top war agency more comprehensive control over allocation of available shipping space. Its purpose is to ensure that commodities of secondary importance to the war effort should not monopolize precious cargo space while urgently needed materials are delayed in shipment.

On the whole, wholesale shortages of chemicals shouldn't be expected next year but the situation will be rather spotty. Sometime in 1943, the effect of the order restricting the construction of new plants will be felt in the war chemicals field. If all the plants that had been planned were built by then, there could be no shortage anywhere. Ammunition will be plentiful. Supply of nitrates will be subject to continued importations from Latin America. Ammonia production could be better, too, if the projected plants could have become realities.

The question whether German patents for the manufacture in the United States of atabrine and plasmochin, effective synthetic substitutes for quinine, should be restricted to two firms or thrown open to United States manufacturers for cheap production of unlimited supplies is causing differences of opinion between government agencies. The issue, after repeated postponements, will be put before the Patent Committee of the Senate any day now.

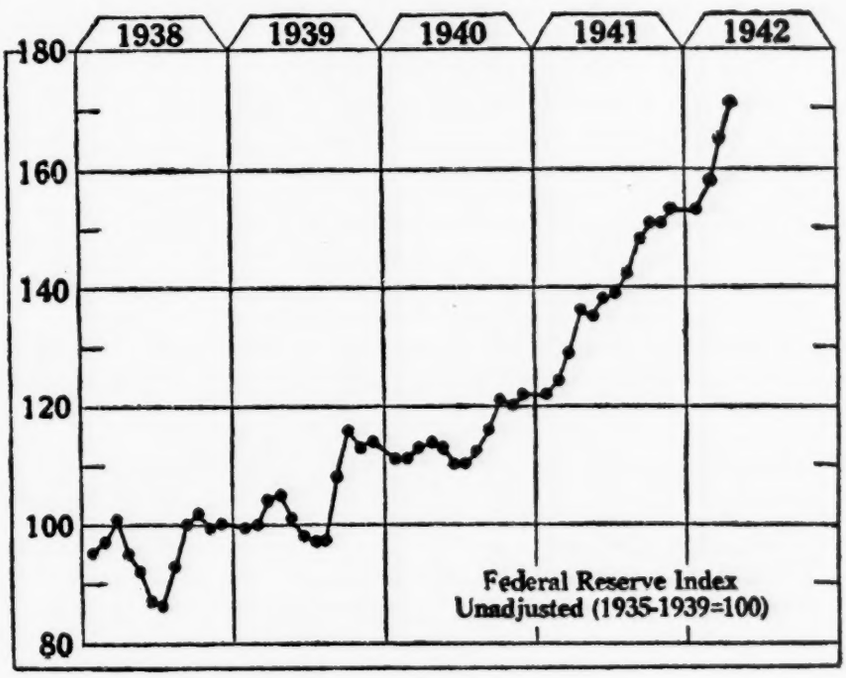
On one side is the Winthrop Chemical Company, subsidiary of Sterling Products Company. Winthrop controls the American patents for the manufacture of atabrine and plasmochin on assignment by the German I. G. Farbenindustrie. It has signed a contract with Merck & Co. of Rahway, N. J., to permit Merck to share in the manufacture of the synthetic substitutes under these patents. Winthrop is represented legally in Washington by Thomas Corcoran, formerly within the inner circles of the New Deal.

Winthrop would like to keep control of the patents and has represented to the government that as a result of enlargement of its plant and the licensing of Merck & Co. it will be able to supply all the atabrine and plasmochin needed.

The Board of Economic Warfare and some other government agencies do not feel sure.

It is argued, therefore, that the only safe course is to have atabrine and plasmochin manufactured in maximum quantities at a minimum price.

CHEMICAL PRODUCTION



Somewhere in the middle of the controversy is the Alien Property Custodian, Leo T. Crowley. Mr. Crowley refused to comment recently. In this case his office controls the atabrine and plasmochin patents only through its ownership of a controlling share in General Aniline and Film Company, which controls Winthrop through the Sterling Products Company. His fiduciary relationship with Winthrop would ordinarily require him to protect its property interest in the patents. On the other side of the question is a possible public interest in the throwing open of the patents.

Heavy Chemicals: Silicate of soda situation is peculiar; producers have ample supplies but government order ODT No. 7 recently issued forbids the use of tank car shipments for other than petroleum products within a 100-mile radius of producing points. One large producer writes that it even has excess capacity at this time. Regardless of inventory restrictions, users of chlorine may accept delivery of the smallest practical delivery unit; date for filing orders with producers advanced to 10th of preceding month—all this is contained in a correction to General Preference Order M-19. Chemical producers were assigned A-1-C rating on 30% of their regular supplies suppliers are permitted to extend this rating to replenish stocks—this is contained in amendment 1 to preference rating order P-89. Soda ash consumption is high attributable in part to the increased use of glass containers. Calcium chloride consumption is on the increase. War demand for certain chemicals continues but some of the boys are beginning to feel the cancellations from manufacturers of non-essential goods. How can I find out what plants are being converted, one supplier wants to know. Output of copper sulfate is high. Additional production, expected on the market by this time, has not appeared. Styrene and benzene are under complete allocation control. Chlorate chemicals are under complete allocation, also, following by-product ammonia and ammonium sulfate, synthetic ammonia, cyanamid, capryl alcohol, isopropyl alcohol and methyl ethyl ketone. Naphthenic acid is under allocation. May prices on domestic sodium nitrate have been extended to June 30 by one producer. Consumption of chemicals in the war program, it is expected, soon will reach high enough levels to take up the slack caused by reduced demands from non-essential production. Restrictions, the general price fixing order, and certain other factors have resulted in the backing up of some inventories. More sodium sulfide seems to be on the market. Exporters continue to have their troubles in moving materials out of the country. Some licenses seem to be granted easily while others get rejected with gusto. All in all, the stuff is moving out in good quantities against orders booked a considerable time ago. Shipping, of course, is still the tremendous problem in this corner. Buyers in South America are particularly anxious to get whatever they can in the chemical field.

Fine Chemicals: Household insecticides have been added to the restricted list of summer seasonal goods on which retailers may establish special ceiling prices. OPA has declared retail sales of agricultural insecticides and fungicides to be seasonal and subject to seasonal pricing methods. OPA has revoked the sliding scale method of pricing ethyl alcohol produced from fermentation of molasses. Companies still offer insecticides, moth preventives, etc. to the public in spite of decreasing supplies. Industry hopes that next year one of three things may happen (or more): (1) Stocks of basic materials will loosen up as more chemical plants go into operation. (2) Out of industry's scrap piles, researchers may find substitutes. (3) The government may later consider woolen conservation sufficiently important to warrant use of critical chemicals in moth preventives. The vital chemical war industries are granted further priority assistance in obtaining maintenance and repair materials by the terms of Amendment No. 1 to General Preference Order P-89 as amended, issued May 22 by the Director of Industry Operations. The amendment allows the chemical producer to use an A-1-a rating to obtain 30 per cent of his regular supplies, and an A-3 for the remaining 70 per cent. The original order allowed use of an A-3 rating for the entire quantity. As in the original order an A-1-a rating may be used to obtain supplies to repair an actual breakdown, and an A-1-c rating to avert an immediately threatened breakdown.

The amendment also allows an A-1-c rating to be extended by suppliers to replenish their stocks. The original order permitted an A-1-a or an A-1-c rating to be extended only when the supplier had no stock of the material in question. The supplier had formerly to depend upon an A-10 rating for replenishing his stocks which was found to be insufficient. As in the original order, no use of these ratings may be made by any producer or supplier unless the producer shall have first obtained a serial number from the Chemical Branch, and until he has filed with the Branch certain required information.

Priorities
Allocations
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. Invaluable to you in your work.

The alcoholic beverage industry is ready to turn over its total facilities for producing alcohol from grain for the manufacture of either gunpowder or synthetic rubber, a survey of leading distillers revealed this month. Military and essential civilian demand for alcohol will total 476,000,000 gallons in 1943, A. I. Henderson, director of the WPB's material division predicted recently.

The estimated demand included 200 million gallons for butadiene, a synthetic rubber ingredient. Production capacity was placed at 540 million gallons. With an expected 1942 surplus or stockpile of 50 million gallons, the 1943 supply will total 590 million gallons.

Mr. Henderson said the production would be achieved by converting the whisky distilling industry to industrial alcohol and fulltime operation of all industrial alcohol plants. Mr. Henderson listed sources of the 1943 production and supply as follows:

	In millions of gallons
Synthetic (from ethylene gas).....	65
Whisky plants now making 190 proof	120
Whisky plants to be converted.....	120
New Orleans industrial alcohol plants	65
Seaboard industrial alcohol plants...	160
Cuba and Mexico.....	10
Total production.....	540
Surplus from 1942.....	50
Total	540

Nearly All Production From Grain

The report said, in part:

Practically all this production will be made from grain. Beverage alcohol plants use grain exclusively and grain handling equipment now is being installed in all Eastern Seaboard plants so they can use either grain or blackstrap molasses, if the latter is available.

Coal Tar Chemicals: Shipments of coal tar products to non-essential lines are being held down to a minimum in view of the heavy war demand. Bulk of production is going into synthetic rubber, manufacture of TNT, picric acid, dyes, etc. Vast quantities of phenol are being exported. Benzol market is in a strong position. Practically all of the toluol being made is going right into the production of TNT. Article is under complete allocation, as you know, and intermediate manufacturers and other consumers are having a tough time getting it. There is very little creosote oil on the market.

Fertilizer Materials: A new high point was reached in 1941 by American farmers in their use of commercial fertilizer. Distribution amounted to

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202 Settlement St. Akron, Ohio

8,400,000 tons, an increase of 7% over 1940. Previous peak of commercial sales was in 1930 with a total of 8,222,000. It seems likely that another new record in fertilizer consumption will be made this year. The food-for-victory program calls for an increase in crop production. Economic factors are favorable to increased fertilizer use. Supplies have been sufficient to satisfy a moderate rise in demand.

Remember that Senate Resolution 229 introduced March 12 by Senator O'Daniel in connection with a proposed investigation of fertilizer? The resolution was referred to the Committee on Agriculture and Forestry and has never been reported out by that committee. Inquiry indicates that there seems to be little inclination on the part of the committee to take any action on the resolution and that it will probably remain in the committee without action. Of course, pressure might be brought to bear to bring committee action, but with the planting season about over it is possible that the matter will not be further agitated. All of the foregoing is straight from one of the best informed individuals in the fertilizer field.

Natural Raw Materials: There are no figures on exports in the eighth annual naval stores report of the Department of Agriculture. These figures are "not available for publication."

However, this report provides the trade with tables on production, carryover, supply and distribution of the various types of turpentine and rosin for the last 12-month season to March 31.

Production for the year ended March 31 totaled 548,796 50-gallon barrels of turpentine and 2,135,593 500-pound barrels of rosin—17,545 barrels less of turpentine and 11,272 barrels less of rosin than the year before. There was an increase in liquid "sulphate wood rosin" from 18,358 tons 1940-41 to 26,887 tons in 1941-42.

Georgia leads in naval stores production, the record for the past season showing 189,532 barrels of gum turpentine. Other states in order of production are Florida, Alabama, Mississippi, the Carolinas, Louisiana and Texas. Georgia produced two-thirds of the crop of turpentine.

Turpentine consumption was credited largely to four groups—paint, varnish and lacquer producers; chemical and pharmaceutical houses; shoe polish and shoe materials manufacturers; and railroads and shipyards. The rosin went principally into paper sizing, soap, chemicals and pharmaceuticals, ester gum and synthetic resins, paint, varnish and lacquer, printing inks and rubber.

Commodity Credit Corp. sales of rosin will be made at not less than parity prices, the Department of Agriculture announced recently. Effective immediately, such sales will be confined to rosin in wood barrels and rosin in steel drums will not be offerred until barrel stocks have been liquidated. The parity price based on the April 15 index is $3.79 per hundred pounds net for an average of the nine grades of rosin eligible for loans.

Policies governing lend-lease shipment and transfers to other government agencies remain unchanged.

Loan stocks of rosin metal drums

Nitrate of Soda, Sulphate of Ammonia and Cyanamid

Maximum Price Regulation No. 108

Issued March 17, 1942; Effective March 23, 1942

§ 1367.21 *Maximum prices for nitrate of soda, sulphate of ammonia and cyanamid.* On and after March 23, 1942, regardless of any contract, agreement, lease, or other obligation, no person shall sell or deliver nitrate of soda, sulphate of ammonia or cyanamid in quantities of 250 pounds or more at prices higher than the maximum prices set forth in Appendix A hereof, incorporated herein as § 1367.30; and no person shall agree, offer, solicit or attempt to do any of the foregoing. The provisions of this Section shall not be applicable to sales or deliveries of nitrate of soda, sulphate of ammonia, or cyanamid to a purchaser if prior to March 23, 1942 such nitrate of soda, sulphate of ammonia or cyanamid had been received by a carrier, other than a carrier owned or controlled by the seller, for shipment to such purchaser.*

§ 1367.30 *Appendix A: Maximum prices for nitrate of soda, sulphate of ammonia and cyanamid.*—(a) *Nitrate of soda*—(1) *Cash sales by mixers, directly or through agents, to consumers.* The maximum price for cash sales of nitrate of soda by a mixer or his agent to consumers for use as fertilizer shall be:

(i) The price paid by such mixer to the producer or importer of such nitrate of soda, *plus*

(ii) An amount equal to the actual transportation expenses incurred by such mixer, *plus*

(iii) The cost of tax tags, if any, and the attaching thereof paid by such mixer, *plus*

(iv) $4.00 per two thousand pounds or $0.20 per hundred pounds.

(2) *Cash sales by mixers to dealers.* The maximum price for cash sales of nitrate of soda by a mixer to dealers shall be:

(i) The price paid by such mixer to the producer or importer of such nitrate of soda, *plus*

(ii) The amount equal to the actual transportation expenses incurred by such mixer, *plus*

(iii) The cost of tax tags, if any, and the attaching thereof paid by such mixer, *plus*

(iv) $2.00 per two thousand pounds or $0.10 per hundred pounds.

(3) *Cash sales by dealers.* The maximum price for cash sales of nitrate of soda by a dealer to consumers for use as fertilizer shall be:

(i) The price paid by such dealer, *plus*

(ii) An amount equal to the actual transportation expenses incurred by such dealer, *plus*

(iii) $2.00 per two thousand pounds or $0.10 per hundred pounds.

(4) *Credit sales.* (i) In the case of credit sales of nitrate of soda by mixers and dealers, charges for credit no more onerous than those in effect during the year 1941 may be added to the maximum prices established by subparagraphs (1), (2) and (3) above.

(b) *Sulphate of ammonia (ammonium sulphate)*—(1) *Cash sales by mixers, directly or through agents, to consumers.* The maximum price for cash sales of sulphate of ammonia by a mixer or his agent to consumers for use as fertilizer shall be:

(i) The price paid by such mixer to the producer, importer or primary jobber of such sulphate of ammonia, *plus*

(ii) An amount equal to the actual transportation expenses incurred by such mixer, *plus*

(iii) The cost of tax tags, if any, and the attaching thereof paid by such mixer, *plus*

(iv) $4.00 per two thousand pounds or $0.20 per hundred pounds, *plus*

(v) $1.50 per two thousand pounds or $0.075 per one hundred pounds when such sulphate of ammonia is purchased in bulk, and resold in bags or other containers by such mixer, *plus*

(vi) The cost of bags or other containers for such sulphate of ammonia, when such sulphate of ammonia is bagged by such mixer.

(2) *Cash sales by mixers to dealers.* The maximum price for cash sales of sulphate of ammonia by a mixer or his agent to dealers shall be:

(i) The price paid by such mixer to the producer, importer or primary jobber of such sulphate of ammonia, *plus*

(ii) The amount equal to the actual transportation expenses incurred by such mixer, *plus*

(iii) $2.00 per two thousand pounds or $0.10 per hundred pounds, *plus*

(iv) $1.50 per two thousand pounds or $0.075 per one hundred pounds when such sulphate of ammonia is purchased in bulk and resold in bags or other containers by such mixer, *plus*

(v) The cost of bags or other containers for such sulphate of ammonia, when such sulphate of ammonia is bagged by such mixer, *plus*

(vi) The cost of tax tags, if any, and the attaching thereof paid by such mixer.

(3) *Cash sales by dealers.* The maximum price for cash sales of sulphate of ammonia by a dealer to consumers for use as fertilizer shall be:

(i) The price paid by such dealer, *plus*

(ii) An amount equal to the actual transportation expenses incurred by such dealer, *plus*

(iii) $2.00 per two thousand pounds or $0.10 per hundred pounds, *plus*

(iv) The cost of bags or other containers for such sulphate of ammonia, if not included in the price paid by such dealer.

(4) *Credit sales.* (i) In the case of credit sales of sulphate of ammonia by mixers and dealers, charges for credit no more onerous than those in effect during the year 1941 may be added to the maximum prices established by subparagraphs (1), (2) and (3) above.

(c) *Cyanamid*—(1) *Cash sales by mixers, directly or through agents, to consumers.* The maximum prices for cash sales of cyanamid by a mixer or his agent to consumers for use as fertilizer shall be:

(i) The price paid by such mixer to the producer or importer of such cyanamid, *plus*

(ii) An amount equal to the actual transportation expenses incurred by such mixer, *plus*

(iii) The cost of tax tags, if any, and the attaching thereof by such mixer, *plus*

(iv) $4.00 per two thousand pounds or $0.20 per hundred pounds.

(2) *Cash sales by mixers to dealers.* The maximum price for cash sales of cyanamid by a mixer or his agents to dealers shall be:

(i) The price paid by such mixer to the producer or importer of such cyanamid, *plus*

(ii) The amount equal to the actual transportation expenses incurred by such mixer, *plus*

(iii) The cost of tax tags, if any, and the attaching thereof paid by such mixer, *plus*

(iv) $2.00 per two thousand pounds or $0.10 per hundred pounds.

(3) *Cash sales by dealers.* The maximum price for cash sales of cyanamid by a dealer to consumers for use as fertilizer shall be:

(i) The price paid by such dealer, *plus*

(ii) An amount equal to the actual transportation expenses incurred by such dealer, *plus*

(iii) $2.00 per two thousand pounds or $0.10 per hundred pounds.

(4) *Credit sales.* (1) In the case of credit sales of cyanamid by mixers and dealers, charges for credit no more onerous than those in effect during the year 1941 may be added to the maximum prices established by subparagraphs (1), (2) and (3) above.

(d) *Territory.* Nothing in this Maximum Price Regulation No. 108 shall apply or be deemed to apply to sales of nitrate of soda, sulphate of ammonia or cyanamid in the states of Washington, Oregon, California, Montana, Wyoming, Idaho, Nevada, Utah, Colorado, and Arizona.*

Church & Dwight Co., Inc.

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Bicarbonate of Soda

Sal Soda

Monohydrate of Soda

Standard Quality

Batch MIXERS

For Chemicals and Food

Specially Designed Double Spiral AGITATORS WET—DRY or LIQUID MATERIALS

Constructed rigidly For continuous operation—Effective power transmission arrangement, together with massive bearing supports and foundation. Stainless Steel, Monel Metal and non-corrosive Linings on specification.

Built from 50-lb. Batch to 4-ton Batch Capacities

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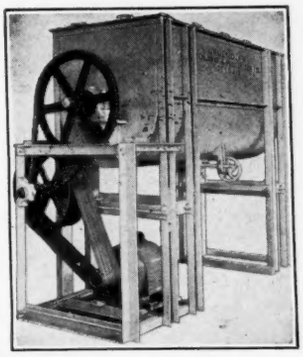

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Ample stocks of 99.5% pure crude sulphur—free from arsenic, selenium and tellurium—plus up-to-date production and shipping facilities at our mines at Port Sulphur, Louisiana, and Freeport, Texas, assure our customers the utmost in steady, dependable service.

FREEPORT SULPHUR COMPANY
122 East 42nd Street ● New York

approximate 332,500 drums. Loans stocks of gum rosin in wood barrels are about 217,000 barrels.

Naval stores demands continue far below expectations for this season of the year. The gum naval stores seems to be facing another crisis in its affairs. There is no indication of what containers will be made available for the trade. There is no indication of how much higher the cost of production may go. Foreign markets are practically obliterated. Building activities, except for war purposes, are practically at an end. The industry is urging that something be done about the situation. Either loan values should be promoted or the government should enter on the purchase of an adequate amount of turpentine and rosin, the trade feels. Naval stores will be cheaper this year than it will be possible to make them next.

An example of what may be done in various localities throughout the country, often on a larger scale, is offered in the following instance.

Knowing that glycerin is an essential commodity in the manufacture of certain explosives, and also that the visible supply is inadequate, the Mt. Hood Soap Co., of Portland, the only company in Oregon having machinery capable of extracting glycerin in the production of soap, announced that they would like to cooperate with housewives in saving and utilizing waste fats and greases. (In the aggregate, large quantities of grease are wasted which might be utilized if this waste could be collected and delivered to an industry capable of using it.)

The principal problem is to get these small amounts without prohibitive expense. The Mt. Hood Soap Co. has advertised in the newspapers, has enlisted the support of "Good Will Industries," and also expects to get cooperation from Boy Scouts and the Salvation Army. Within a short time, they have received fats and greases from 20 persons who have brought it to the plant; they have also received telephone calls from 50 persons and letters from 15, all promising cooperation.

The company pays from 5 cents to 6 cents a pound, which is stated to be the present market price. They hope to work out adequate methods for collection so that the volume may be sufficient to make the project worth while in the future.

It has been stated that about 7% glycerin is recovered from this fat.

Between the Lines

(*Continued from page 778*)

The application of these several substances suggests not only their value in the present emergency, but what may be expected to happen on a world-wide scale when the war ends, and the vital task is placed largely on the shoulders of America, of restoring whole populations from starvation and disease.

Vitamin B^1 is developing new usefulness constantly, but is associated with treatment of dietary deficiency diseases, neuritis, treatment of some forms of dental caries, scurvy, of course, and others. What the wars' end will disclose in the way of fields of use for just this one vitamin is an interesting subject of speculation.

Vitamin C, known also as ascorbic acid, is regarded as an essential in the diet of nursing mothers, and in the growth of young children, as well as in treatment of certain infectious diseases.

Meanwhile the present war has created a widespread demand, and the shipments not only of food, but of vitamin supplies in one or another forms, have gone not only by water, but by air. It is not generally known that bombers, ferried across the Atlantic, have carried such concentrated cargoes, but this is the case.

The varied conditions under which our own forces have been called on to serve, from the tropics to Iceland, have created their own problems. Heavy supplies have been required for American troops serving in Iceland, Northern Ireland, and the outposts of the Caribbean and Pacific.

As indicated, the United States has been forced to call in its own resourcefulness, as well as its natural bounty, in meeting these various needs. The prospect of still further requirements as history takes its course abroad points to an interesting future for this field of industry.

Washington

(*Continued from page 732*)

cation control by WPB in amendment to M-40.

Household insecticides included in OPA list on which retailers may establish ceiling prices through procedure outlined in Price Regulation 142.

Price Regulation 144 issued by OPA, terming retail sales of agricultural insecticides and fungicides as seasonal.

Specific provision made by OPA in Amendment 2, to Price Schedule 53 (Fats and Oils) for handling cases where sellers of fats and oils are unable to determine maximum prices under any of the five prescribed procedures in the schedule.

Oil processors and industries coking coal were directed by amendment to Order M-34 (Toluene Allocation) to operate plants so as to produce a maximum of toluene. Oils from petroleum industry are not affected; the amendment applies to drip oil from the gas industry and light oil from coal coking.

Users of chlorine are permitted under amendment to Order M-19, to accept delivery of chlorine in the smallest practical delivery unit.

Arsenic placed under allocation control by General Preference Order M-152, defined as arsenious acid, or arsenic trioxide, either in crude (black or gray) or refined form; not including any other chemical derivatives or compounds.

WPB assumed control of imports of all known commercial oils not previously under such restriction, in amendment to M-63; including fats, seeds and nuts, cinchona or other bark from which quinine is derived, and corundum.

The OPA has revoked the sliding scale basis of pricing ethyl alcohol produced from fermenting molasses, due to the fact that Government purchase of the Cuban molasses supply has now enabled this agency to stabilize the price in resale to users. It was found that no producer had availed itself of the sliding scale procedure to support a price in excess of OPA maximums.

Canadian Review

(*Continued from page 828*)

of better employee-employer relations through Canadian industry. From 28 years personal experience as worker and boss in the pulp and paper industry (he has been a member of two different unions) he knows that men do better work "if they are working for you and not merely with you." Similar views have been expressed recently by Canada's Big Boss of war production, the Hon. C. D. Howe, Minister of Munitions and Supply.

Mr. Howe's department has written to every holder of a war contract urging that a labor-management council be set up to find ways and means of increasing production. This parallels a similar move by the U. S. War Production Board. It is yet too early to know just how the plan will be made effective in Canada except that there will be considerable latitude in the type of organization which is named in each plant or organization.

In recent weeks, Canada-U. S. relations which have been much in the public eye have been the extension of Canada's gas rationing plan and the deliberations of the United Nations Air Conference.

Canada started her official gas ration coupon system on April 1 on a nation-wide basis. The average car driver is allowed 60 coupons or "units" a year. Value of the coupon will vary according to needs. Up until the middle of May it was 5 gallons per coupon or 300 gallons a year. The aim was to work out a plan whereby all Canadians would share the burden of sacrifice equally. However, unusually severe tanker losses on the Atlantic seaboard forced a temporary cut for maritime motorists from 5 to 2 gallons per coupon in mid-May. Further restrictions for all Canadians are expected.

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U.S.I. CHEMICAL NEWS

June ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1942

New Addition Agent Ends Corrosion of Iron by Lacquers

Forms Film to Protect Surface Of Unlined Steel Containers

EVERETT, Mass.—The tendency of clear lacquers, alcoholic shellacs, and nitrocellulose solutions to corrode plain steel containers can be overcome by the addition of small quantities of a new organic chemical.

This announcement by a manufacturer here suggests interesting possibilities for lacquer packaging during the current limitations on tin supplies. Because of the relatively low cost of the new chemical, it is believed that its use may continue after the tin shortage is relieved.

The chemical, it is explained, reacts with the metal surface of the container to form an insoluble film, which, though of microscopic thickness, is sufficient to afford the necessary protection. Because of the nature of its formation, the film is self-mending in case of breaks.

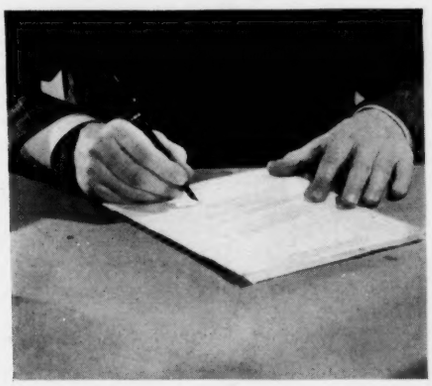
Only small quantities are needed to produce the desired effects, it is reported. In normal clear lacquers, about one-half ounce of the chemical per gallon of lacquer is sufficient.

Information on source of supply of the new chemical can be obtained from U.S.I.

Coating Improves Wetting Characteristics of Rubber

AKRON, Ohio—The wetting characteristics of rubber surfaces can be greatly improved by the simple expedient of applying a very thin coating of rosin. The coating is of particular value in applications such as fountain pens or rubber-covered rolls for paper mills, in which the rubber is subjected to contact with watery materials.

These claims are made in a patent granted to an inventor here, who says that the coating is more effective than treatment with most commercial wetting agents. A particularly satisfactory coating can be obtained with a solution of 2% by weight of ordinary gum rosin in acetone. Other solvents that can be used include ethanol and butyl acetate.



Rosin coating on feed member of fountain pen improves wetting characteristics and ink flow.

A. A. Backus Dies; Was in Charge of Production for U.S.I.

Arthur A. Backus, Vice-President in Charge of Production of U.S.I. since 1928, was fatally injured on May 18 when he accidentally fell from a train en route from his home in Stamford, Conn., to New York.

During his many years with U.S.I., he rendered invaluable services to the company, serving as Director of Research from 1916 to 1924, and as Production Manager from 1924 to 1928. In 1928 he was appointed to the position which he held until the time of his death. He was also a director of Stroock & Wittenberg Corporation, Cuba Distilling Company, Dominican Molasses Company, and Porto Rico Mercantile Company.

A. A. Backus

He was a member of the American Chemical Society, American Institute of Chemical Engineers, Society of Chemical Industry, the Chemists' Club of New York, and the Uptown Club.

His loss will be keenly felt by all who associated with him, as well as by the chemical industry as a whole, the progress of which was materially aided by his valuable contributions.

Determinations of flash points for the various formulas of industrial alcohol, recently conducted at U.S.I.'s laboratories, show values considerably higher than those now listed in the Industrial Alcohol Catalog. A new data sheet has been prepared, listing revised flash points for pure, C.D., and S.D. alcohol, as well as for alcohol-water mixtures. Copies of the data sheet can be obtained free of charge from U.S.I. Ask for Bulletin FP.

Users Asked to Return Empty 55-Gallon Drums

Users of U.S.I. products are urged to return all empty 55-gallon drums as promptly as possible, to alleviate the container shortage.

U.S.I. suggests that as soon as two or more drums have been emptied, they should be turned over to the nearest freight agent for shipment to U.S.I. Large users should ship full

carloads of 276 drums wherever practicable. Return freight will be paid by U.S.I., and credit will be given at full ceiling price for all drums which are received in good condition, and which have not been used for storage of materials other than original contents.

To comply with Federal regulations, all markings on head of drum must be obliterated as soon as drum is emptied.

Partition Analysis Best in Cellulose Mixed Ester Tests

Butyl Acetate Gives Accurate Results in Determinations

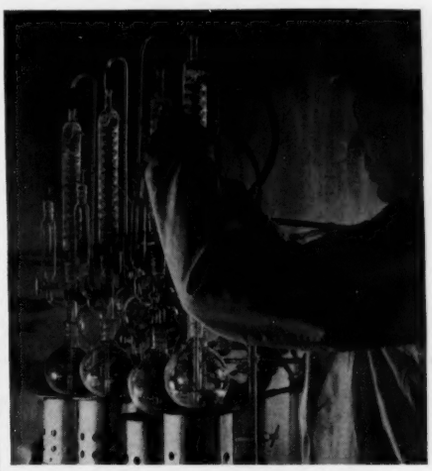
Of the various methods which have been proposed for determination of the combined acids in cellulose mixed esters, best results appear to be obtained by differential partition of the acids between immiscible solvents, according to reports of research work conducted by a leading producer of the mixed esters. Especially satisfactory results are obtained when water and normal butyl acetate are used in the determinations.

The cellulose mixed esters, such as cellulose acetopropionate and cellulose acetobutyrate, owe much of their popularity to the fact that it is possible to vary their properties within certain limits by varying their composition. Hence there is need for a practical, accurate method of analysis as a check on composition, and considerable study has been devoted to the subject. It has been found that, by means of the partition method using butyl acetate, commercial cellulose acetobutyrates and acetopropionates can be analyzed with an accuracy of about ± 0.2 weight per cent acyl.

Uses of Mixed Esters

The cellulose mixed esters offer interesting possibilities for use in cases in which cellulose acetate does not have all the desired properties. In general, the mixed esters are characterized by a wider range of solubility and compatibility, and are more resistant to water and

(*Continued on next page*)



The equipment shown here is employed in the research work constantly carried on at U.S.I. to develop new acetoacetarylides and improve the quality of existing ones. These compounds are used as intermediates in the manufacture of yellow pigment dyestuffs characterized by excellent color tone, brilliance, and durability. Acetoacetanilide, acetoacet-ortho-chloroanilide, acetoacet-para-chloroanilide, acetoacet-ortho-toluidide, and acetoacet-ortho-anisidide are in commercial production at U.S.I., and samples of many other acetoacetarylides can be supplied for laboratory investigation of their potentialities.

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June ★ **U.S.I. CHEMICAL NEWS** ★ 1942

Studies Reveal Further Uses for Ethyl Carbonate

Additional light is thrown on the potentialities of ethyl carbonate by recently published papers, which supplement the information on the reactions of this chemical as given in the April, 1942, issue of U.S.I. CHEMICAL NEWS.

One of these papers discusses the synthesis of malonic esters from esters of monobasic acids in accordance with the general equation:

$$R'CH_2COOR + (RO)_2CO + MOR \rightarrow [R'C(COOR)_2]M + 2ROH$$

A second paper describes the synthesis of beta-keto esters by the condensation of alkyl carbonates with ketones according to this equation:

$$R'COCH_3 + (RO)_2CO + MOR \rightarrow [R'COCHCOOR]M + 2ROH$$

Another recent investigation deals with the synthesis of alpha-cyano esters by condensing nitriles with alkyl carbonates:

$$R'CH_2CN + (RO)_2CO + MOR \rightarrow [R'C(CN)COOR]M + 2ROH$$

It has also been discovered that the alkyl carbonates, contrary to previous beliefs, are excellent alkylating agents for malonic esters, and are as useful in this respect as the alkyl halides and sulfates. Most monosubstituted malonic esters were found to be readily alkylated by heating the metal derivatives with alkyl carbonates:

$$[R'C(COOR)_2]M + (RO)_2CO \rightarrow R'RC(COOR)_2 + RMCO_3$$

Alkyl carbonates have also been found useful as reaction media for metalating or alkylating a variety of malonic, beta-keto, and alpha-cyano esters. The substitution of alkyl carbonates for ethanol as the reaction medium prevents the cleavage of a carbalkoxyl group by alcoholysis as an undesired side reaction. Two general types of alkylation that were investigated are shown by the following equations:

$$[RC(COOC_2H_5)_2]M + R'Br \rightarrow RR'C(COOC_2H_5)_2 + MBr$$

$$[CH_3COCRCOOC_2H_5]M + R'Br \rightarrow CH_3CORR'COOC_2H_5 + MBr$$

Good yields were obtained with ethyl carbonate as the reaction medium in certain cases in which only insignificant yields had previously been obtained.

While the equations have been presented in general form applying to alkyl carbonates, ethyl carbonate was actually used in most of the work. The metal used (denoted by M in the equations) was usually sodium, and was removed from the product by acidifying with acetic acid. Those reactions in which an alcohol was a product could be readily pushed to completion by stripping off by distillation any alcohol produced and any originally contained in the mixture.

Succeed in Fractionating Soybean Oil Phosphatides

LAFAYETTE, Ind.—The commercially useful phosphatides in soybean oil can be recovered by adsorption on a solid adsorbent, followed by successive extraction with organic solvents, it has been discovered by research workers here.

The solvents employed are acetone, ether, absolute ethanol, and 50% ethanol. The acetone extract has been found to consist largely of oil with some phosphatides, sterols, and sterol glucosides. The ether extract contains material with the physical properties usually ascribed to phosphatides, but with a P:N ratio of about 2:1.

The material abstracted by absolute ethanol has a P:N ratio of about 1:1, and is apparently at least 50% true phosphatides, with more lecithin than cephalin. Extraction with 50% ethanol yields lecithin and cephalin also, and in addition acidic material which can be hydrolyzed with acids to form large quantities of sugar. This substance has marked foaming properties.

The ether fraction can be further extracted with ethanol to yield a viscous liquid which is soluble in acetone and has good emulsifying properties.

Partition Analysis of Cellulose Mixed Esters

(*Continued from preceding page*)

alkalis. They can be used in the formulation of clear metal lacquers for the protection of brass, bronze, copper, aluminum, magnesium, and steel, and produce durable, weather-resisting coatings. Finishes of this type have been used in the protection of bronze statuary.

While the cellulose mixed esters are somewhat higher in cost than certain other lacquer bases, this factor is partly offset by their solubility in common solvents, and by their ability to produce finishes of superior characteristics. Cellulose acetopropionate is frequently used in a solvent mixture of equal parts of ethanol and toluol. A mixture of SOLOX and ethylene dichloride is a popular solvent for cellulose acetobutyrate.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A new corrosion-proofing material is available in liquid and plastic forms for application to metal or ceramic surfaces. It is said to provide protection against dilute or concentrated acids or alkalis up to 300° F. Uses suggested by the maker include storage and process equipment, plating tanks, and fume ducts. **(No. 580)**

U S I

A new dyeing process is described as applicable to the coloring of transparent and translucent white plastics. Any color other than pure black or white can be imparted. Process is said to leave the work with a finish equal to that of the pieces before processing. **(No. 581)**

U S I

Beeswax substitutes are available in two grades, one very light in color and the other medium yellow. Chemical analyses and other tests are said to show that the substitutes have properties very similar to imported beeswax, and can be used in many applications. **(No. 582)**

U S I

Electrically conducting rubber is now available in the form of shoe soles and heels for workers in plants where there are explosion hazards. The conductive rubber helps reduce the danger of static electricity, and is also available for such applications as table tops, hose, and conveyor and power transmission belting, according to the maker. **(No. 583)**

U S I

A highly porous form of silica is now available in commercial quantities, particularly for war paint applications. It is said to be useful as a suspending agent to effect soft settling in zinc chromate primers; as a flatting agent in lusterless metal finishes and airplane dopes; for prevention of pigment floating; and for control of viscosity and flow. **(No. 584)**

U S I

pH determinations can be quickly carried out by using a new buffer set in connection with pH test paper, it is claimed. 17 buffer tablets provide basis for solutions of known pH value, which are used to bring out on the test paper the paper's color for any pH value. **(No. 585)**

U S I

A tung oil substitute is reported to make possible the production of satisfactory wrinkle finishes without the use of tung oil. The substitute is described as having a linseed oil base. **(No. 586)**

U S I

Sperm and coconut oils can be satisfactorily replaced in the leather tanning industry by recently developed substitutes, it is reported. The sperm oil subsitute is described as superior in many respects, while the coconut oil substitute has the necessary non-oxidizing qualities.

U S I **(No. 587)**

A rubber extender can be used to replace from 5 to 20% of crude rubber or reclaim in all types of compounds without sacrifice of physical properties, it has been announced. **(No. 588)**

U S I

Blacking out and shatterproofing of windows can be obtained with a new coating, which is said to make windows opaque for periods of a year or more, and also to provide protection from flying glass. **(No. 589)**

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CHEMICALS · INDUSTRIAL · ANTI- · SOLVENTS · ALCOHOLS · FREEZE · USI SERVICE TO INDUSTRY

ALCOHOLS
Amyl Alcohol
Butanol (Normal Butyl Alcohol)
Fusel Oil—Refined

Ethanol (Ethyl Alcohol)
Specially Denatured—All regular and anhydrous formulas
Completely Denatured—all regular and anhydrous formulas
Pure—190 proof, C.P. 96%, Absolute
U.S.I. Denatured Alcohol
Anti-freeze
*Super Pyro Anti-freeze
*Solox Proprietary Solvent
*Solox D-I De-icing Fluid

***ANSOLS**
Ansol M
Ansol PR

ACETIC ESTERS
Amyl Acetate
Butyl Acetate
Ethyl Acetate

OXALIC ESTERS
Butyl Oxalate
Ethyl Oxalate

PHTHALIC ESTERS
Amyl Phthalate
Butyl Phthalate
Ethyl Phthalate

OTHER ESTERS
*Diatol
Ethyl Carbonate
Ethyl Chloroformate
Ethyl Formate

INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-anisidide
Acetoacet-ortho-chloranilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloranilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

ETHERS
Ethyl Ether
Ethyl Ether Absolute—A.C.S.

OTHER PRODUCTS
Acetone
Collodions
*Curbay B-G
*Curbay Binders
*Curbay X (Powder)
Ethylene
Ethylene Glycol
Nitrocellulose Solutions
Potash, Agricultural
Urethan
*Vacatone

*Registered Trade Mark

(*Cont'd from Page 779*)

able as they are produced by all of the major oil companies.

When the Stoddard-type solvents will not clean properly the windings of electrical machines, a mixture of the solvent with carbon tetrachloride will often be found effective. This mixture on a fifty-fifty basis is not inflammable, but vapors from it, combined with right proportions of air, are explosive.

In extreme cases, the use of carbon tetrachloride alone may be necessary to effect proper cleaning, but its use necessitates unusual precautions against damage to windings and danger to the operator. Carbon tetrachloride fumes are dangerous to human life and therefore workmen should guard against inhaling them. The use of gas masks is even recommended for workmen using this liquid especially if in pits, and holds of vessels, or any other confined space where adequate ventilation is impossible.

Besides the danger to human life, the use of straight carbon tetrachloride has the drawback of being more corrosive in its action than the petroleum distillates. For that reason when used, its residue should be removed by applying petroleum solvent to prevent injurious action later.

Observe These Rules

In the use of any cleaning compounds the following simple rules should be observed:

(1) Supply adequate ventilation.

(2) Where ventilation is poor, use gas masks so workmen will not inhale fumes.

(3) Avoid saturation of workers' clothes with the cleaning solvents.

(4) Workmen's shoes should not have protruding nails.

(5) Avoid metal to metal contacts, such as striking the machine frame with metal tools, which may cause dangerous sparks.

(6) If using a hose to spray either cleaning solution or varnish, make sure that the nozzle is grounded.

(7) Always have fire extinguishers of the carbon tetrachloride type handy.

After windings are thoroughly cleaned and before varnish treatments are applied they should be dried in an oven (electrically or steam heated types are the safest) having the temperature suitably controlled within safe operating limits. The drying out temperature should never exceed 115° C., 239° F.

We have pointed out accepted methods of caring for electrical equipment that has shown distress in one form or another. It might be well to consider just a few of the factors that influence motor operation and that have direct bearing on the maintenance necessary to keep a plant running.

For best overall operation, motors should be operated near full load and at their rated voltages, even though commercial limits permit variations 10% above and below these normal voltage ratings. High voltage at the motor terminals reduces power factor and slip and increases torque. Low voltage increases power factor and slip, and reduces torque—each without material change in efficiency. Operating full loaded at low voltage means increased current which obviously may cause the motor losses to rise to a point where temperatures injurious to insulation may result. Since high voltage increased the iron loss, the desirability of keeping the voltage near the rated value becomes apparent.

Where coupled-type motors are used the couplings require regular inspection. Faulty alignment in a solid coupling is reflected in bearing trouble. If trouble is indicated make sure that all dowel pins are in the correct position and check the faces of the coupling halves with a feeler gage after the bolts have been removed. Shift the motor position if necessary to make the faces of the two half couplings parallel.

Flexible couplings will operate under more severe misalignment without causing troubles; however, the two halves should be checked with a steel scale to make sure that they are in alignment. Any misalignment means increased wear on the pins, fingers, and leather discs, whichever may be used.

Common causes of mechanical failures to motors are:

(1) End thrust. This may be caused by coupling defects, improper alignment, improper levelling, or inaccurately centered rotors causing unbalanced magnetic pull and ultimate alignment.

(2) Excessive belt tension. This should be kept reasonably low.

(3) Misalignment between motor and driven machine. All couplings should have periodic inspection and any necessary adjustments made to assure freedom from bearing trouble.

(4) Improper lubrication of bearings to meet peculiarities of operating conditions on both ball and sleeve bearing motor. Correct grades and types of lubricants should be selected to meet the operating conditions, and at all times should be kept at correct levels. Modern sealed-sleeve bearings keeping dirt out and oil in require a minimum of inspection and are well protected against overfilling. Older types of bearings, often leak badly if overfilled, causing the oil to be carried with the cooling air into the motor windings, resulting with insulation breakdowns.

Our present war efforts make it imperative that all machinery work continuously at maximum capacity, and in no industry is this more important than in chemicals. Careful maintenance programs will go far in achieving this objective.

THE AUTHORS

Henry E. Dralle is manager of the Petroleum and Chemical Section of the Industry Engineering Department of Westinghouse. He graduated as an electrical engineer from the University of Illinois in 1916 and has been associated continuously with Westinghouse for 25 years. Following general engineering activities, including special work with Dr. Frank Conrad, Assistant Chief Engineer at Westinghouse, Mr. Dralle has specialized in the application of electricity to the process industries since the fall of 1922.

W. W. McCollough is Service Engineer in the Maintenance Department of the East Pittsburgh Works. He was graduated from the University of Texas in 1909, where he received a degree of Bachelor of Science and Electrical Engineering. He joined Westinghouse in 1914 and worked as Electrical Engineer on the test floor. He has been directly connected with problems involving the installation of electrical apparatus in industrial plants and power stations and with maintenance work during most of this time.

H. E. Dralle

W. W. McCollough

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 - May 1942 $0.94

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Acetaldehyde, 99%, 55, 110 gal drs, wks ....lb.	...	.11	.11	.11	.11
Acetaldol (Aldol), 55, 110 gal drs, c-l, wks ....lb.	...	.12	.12	.11	.13
Acetamide, tech, kgs, wks .lb.	.28	.45	.28	.45	.28	.45
Acetanilid, tech, cryst, bbls ....lb.	.29	.31	.29	.31	.29	.31
powd, bbls ....lb.	.27	.29	.27	.29	.27	.29
Acetic Anhydride, drs, c-l, frt all'd ....lb.	.11½	.13	.11½	.13	.10½	.13
Acetin, tech, lcl drs ....lb.	...	.29	.29	.29	.29	.33
Acetone, tks, delv (*PC*) ..lb.	.07	.158	.07	.158	.06	.158
drs, c-l, delv (*PC*) ....lb.	.08½	.173	.08½	.173	.07½	.173
Acetonitrile, drs, wks ...lb.	1.00	2.00	1.00	2.00	1.00	2.00
Acetophenone, drs ....lb.	1.55	1.60	1.55	1.60	1.55	1.60
Acetophenetidin, bbls, kgs, 1000 lbs ....lb.	...	1.00	1.00	1.00	1.00	1.00

ACIDS

Acetic, 28%, bbls (*PC*) 100 lbs.	3.38	3.63	3.38	3.63	2.23	3.43
glacial, nat, bbls ..100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
synth, drs ....100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
tks, wks ....100 lbs.	6.25	6.93	6.25	6.93	...	...
Acetylsalicylic, USP, (*PC*) special, 200 lb bbls ....lb.	...	.45	.45	.45	.45	.45
Standard USP ....lb.	...	.40	.40	.40	.40	.40
Adipic, fib drs, wks ....lb.	...	.31	.31	.31	.31	.31
Anthranilic, ref'd bbls ...lb.	1.20	1.25	1.20	1.25	1.15	1.20
tech, bbls ....lb.	...	.95	.95	.95	.75	.95
Ascorbic, bots, drs (*PC*) oz.	1.50	1.70	1.50	1.85	1.85	2.10
Battery, cbys, wks ..100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, bbls ....lb.	.43	.47	.43	.47	.43	.47
USP, bbls ....lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran. frt all'd bgs 40 tons ....ton *a*	...	99.00	99.00	99.00	93.50	99.50
bbls ....ton *a*	...	109.00	108.00	109.00	108.00	108.00
Broenner's, bbls ....lb.	...	1.11	1.11	1.11	1.11	1.11
Butyric, c-l drs, wks ....lb.	...	.22	.22	.22	.22	.22
tks, wks ....lb.	...	.21	.21	.21	.21	.21
Caproic, drs, wks ....lb.	...	.35	.25	.35	.25	.30
Chlorosulfonic, drs, wks ..lb.	.03	.04½	.03	.04½	.03½	.05
tks, wks ....lb.	...	.02½	.02½	.02½	...	...
Chromic, drs (*FP*) ....lb.	.16¼	.18¼	.16¼	.18¼	.15¼	.17¼
Citric, crys, gran, bbls ..lb. *b*	.20	.21	.20	.21	.20	.21
Anhyd gran, drs (*PC*) lb.	.22½	.26½	.22½	.26½	.23	.26½
Cleve's bbls ....lb.	...	.65	.65	.65	.65	.65
Cresylic 50%, 210-215° HB, drs, wks, frt equal (A) gal.	.81	.83	.81	.86	.76	.84
Low Boiling ....gal.	.81	.83	.81	.86	.76	.84
Formic, tech, cbys ....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls ....lb.	.27	.31	.27	.31	.24	.29
Gallic, tech, bbls ....lb.	1.10	1.12	1.10	1.13	.90	1.13
NF bbls ....lb.	1.27	1.30	1.27	1.30	1.10	1.30
H, bbls wks ....lb.	...	.45	.45	.45	.45	.45
Hydrochloric, see muriatic						
Hydrocyanic cyls, wks ...lb.	.80	1.00	.80	1.00	.80	1.00
Hydrofluoric, 30%, bbls, wks ....lb.	.06	.06½	.06	.06½	.06	.06½
Hydrofluosilic, 35%, bbls lb.	.09	.09½	.09	.09¼	.09	.09½
Lactic, 22% dark, bbls ...lb.	.029	.0315	.029	.035	.02½	.035
22%, light, bbls wks ...lb.	.039	.0415	.039	.0415	.03½	.0415
44%, dark, bbls wks ...lb.	.063	.0655	.063	.0655	.05½	.0655
44%, light, bbls wks ...lb.	.073	.0755	.073	.0755	.06½	.073
Lauric, dist, tech, drs ....lb.	.20	nom.	.20	.20½	.15	.18¾
Laurent's bbls ....lb.	...	.45	.45	.45	.45	.45
Maleic, powd, drs ....lb.	...	.30	.30	.30	.30	.30
Anhydride, drs ....lb.	.25	.26	.25	.26	.25	.26
Malic, powd, kgs ....lb.	...	.47	.47	.47	.47	.47
Mixed, tks N unit ....lb.	.05	.06	.05	.06	.05	.06
S unit ....lb.	.0085	.009	.0085	.009	.0085	.009
Molybdic, kgs, wks ....lb.	.95	1.10	.95	1.10	.95	1.10
Monochloracetic, tech, bbls ....lb.	...	.17	.17	.17	.15	.18
Monosulfonic, bbls ....lb.	...	1.50	1.50	1.50	1.50	1.50
Muriatic, 18° cbys, c-l wks ....100 lb.	...	1.50	1.50	1.50	1.50	1.50
tks, wks ....100 lb.	...	1.05	1.05	1.05	1.05	1.05
20°cbys, c-l, wks ..100 lb.	...	1.75	1.75	1.75	1.75	1.75
tks, wks ....100 lb.	...	1.15	1.15	1.15	1.15	1.15

a Powdered boric acid $5 a ton higher; USP $25 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal.

(*A*) Allocations. (*FP*) Under full priority control. (*PC*) Under price ceiling.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Acid (continued):					
22° cbys, c-l, wks ..100 lb.	...	2.25	2.25	2.25	2.25	2.25
tks, wks ....100 lb.	...	1.65	1.65	1.65	1.65	1.65
CP cbys ....lb.	.06½	.08	.06½	.08	.06½	.08
Myristic, dist, drs ....lb.	.19	.19½	.18	.19½	.18	.18½
Naphthenic drs, 220-230 ..lb.	...	.13	.10	.13	.10	.10
tks, wks ....lb.	...	.10	.09	.10	.09	.09
Naphthionic, tech, bbls ...lb.	.60	.65	.60	.65	.60	.65
Nicotinic cns ....lb.	...	6.96	6.96	7.15	7.15	7.15
Nitric, 36°, cbys, c-l, wks ....100 lbs. *c*	...	5.00	5.00	5.00	5.00	5.00
38°, c-l, cbys, wks 100 lbs. *c*	...	5.50	5.50	5.50	5.50	5.50
40°, c-l, cbys, wks 100 lbs. *c*	...	6.00	6.00	6.00	6.00	6.00
42°, c-l, cbys, wks 100 lbs. *c*	...	6.50	6.50	6.50	6.50	6.50
CP, cbys ....lb.	.11½	.13	.11½	.13	.11½	.13
Oxalic, bbls, wks (*PC*) ..lb.	.11¼	.12½	.11¼	.14½	.11½	.14¼
Phosphoric, 85% USP, cbys ....lb.	...	.12	.12	.12	.12	.12
50% food grade, c-l, bbls, wks, frt equal ..100 lbs.	4.00	4.25	4.00	4.25	4.00	4.25
Picramic, kgs ....lb.	.65	.70	.65	.70	.65	.70
Picric, bbls, wks ....lb.	...	.35	.35	.35	.35	.35
Propionic, pure, drs, wks lb.	...	.14	.14	.14	.14	.14
tks, wks ....lb.	...	.11	.11	.11	.11	.11
Pyrogallic, tech, lump, pwd, bbls ....lb.	...	1.45	1.45	1.45	1.45	1.45
USP, cryst, cns ....lb.	...	2.10	2.10	2.10	1.70	2.25
Pyroligneous, bbls, delv gal.	...	.25	.25	.25	.25	.25
Ricinoleic, tech, drs, wks lb.	.32	.37	.32	.37	.32	.37
Salicylic, tech, 125 lb bbls, wks (*PC*) ....lb.	...	.33	...	.33	...	.33
USP, bbls ....lb.	.35	.46	.35	.46	.35	.40
Sebasic, tech, bbls, wks ..lb.	...	.82	.82	.82	.82	.82
Stearic, see under Oils & Fats						
Succinic, bbls ....lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb drs, wks lb.	...	.17	...	.17	...	.17
Sulfuric, 60°, tks, wks ..ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks ....100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks ....ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks ....100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks ....lb.	.06½	.08	.06½	.08	.06½	.08
Fuming (Oleum) 20% tks, wks ....ton	...	19.50	...	19.50	18.50	19.50
Tannic, tech, 300 lb bbls ..lb.	.71	.73	.71	.73	.54	.73
Tartaric, USP, gran, powd, 300 lb bbls ....lb.	...	.70½	...	.70½	.46¼	.70½
Tobias, 250 lb bbls ....lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles ...lb.	2.00	2.50	2.00	2.50	2.00	2.50
Tungstic, pure, 100 lb pkg. lb.	...	2.86	...	2.86	no prices	
Acrylonitrile, tks ....lb.	...	.34	.34	.34	...	...
Albumen, light flake, 225 lb bbls ....lb.	.65	.75	.65	.75	.55	.75
dark, bbls ....lb.	...	.13½	.12½	.14	.13	.18
egg, edible ....lb.	1.73	1.78	1.73	1.85	.65	1.85
Alcohol, Amyl (from Pentane) tks, delv ....lb.	...	.131	...	.131	.111	.131
c-l, drs, delv ....lb.	...	.141	...	.141	.121	.141
lcl, drs, delv ....lb.	...	.151	...	.151	.131	.151
Amyl, normal lcl drs Wyandotte, Mich. ....lb.	...	.42	.27	.42	.25	.27
secondary, tks, delv ....lb.						
drs, c-l, delv E of Rockies ....lb.	...	.09½	...	.09½	...	.09½
tertiary, rfd, lcl, drs, f.o.b., Wyandotte, frt all'd ....lb.	...	.09	...	.09	...	.09
Benzyl, cans ....lb.	.65	.75	.65	.75	.65	.75
Butyl, normal, tks, f.o.b. wks, frt all'd (*PC*) ..lb.	.13½	.168	.12½	.168	.09	.158
c-l, drs, f.o.b. wks, frt all'd ....lb.	.14	.173	.13½	.173	.10	.168
Butyl, secondary, tks, delv ....lb.	...	.08½	...	.08½	.07¼	.08½
c-l, drs, delv ....lb.	...	.09½	...	.09½	.08¼	.09½
Butyl, tert denat c-l drs lb.	...	.12½	...	.12½	...	.12½
lcl drs ....lb.	...	.13	...	.13	...	.13
tks ....lb.	...	.11½	...	.11½	...	.11½
Capryl, drs, crude, wks lb.	...	.16	...	.16	...	.16
Cinnamic, bottles ....lb.	3.00	3.60	3.00	3.60	2.33	3.60
Denatured, CD, 14, c-l drs, wks (*PC, FP*) gal.	...	.65	...	.65	.36½	.45½
tks, East, wks ....gal.	...	.58	...	.58	.26½	.58
Denatured, SD, No. 1, tks,	...	.53	...	.53	.28½	.53

c Yellow grades 25c per 100 lbs. less in each case. *d* Prices given are Eastern schedule; Territories other east of Rockies and 15½c per gal. less than Eastern Works price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, chys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

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Providence, R. I.

40th St. & Calumet Ave.
Chicago, Ill.

Chemicals for Industry

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Alcohols (continued):					
Diacetone, pure, c-l drs, delv ... lb. *f*	.11½	.14½	.11½	.14½	.09½	.13
tks, delv ... lb.	.10½	.13½	.10½	.13½	.10½	.13½
tech, contract, drs, c-l, delv ... lb.	.11	.13½	.11	.13½	.09	.12
tks, delv ... lb.	.10	.14	.10	.14	.10	.12½
Ethyl, 190 proof molasses, tks ... gal. *g*	...	8.12	...	8.12	5.96½	8.12
c-l, drs ... gal. *g*	...	8.19	...	8.19	6.02½	8.19
c-l, bbls ... gal. *g*	...	8.25	...	8.25	6.03½	8.25
Furfuryl, tech, 500 lb. drs lb.	.20	.25	.20	.25	.20	.25
Hexyl, secondary tks, delv lb.	...	.23	...	.23	.12	.23
c-l, drs, delv ... lb.	...	.24	...	.24	...	.13
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	.32
drs, lcl, delv ... lb.	...	.22½	...	.22½	.22½	.27
Isobutyl, ref'd, lcl, drs lb.	...	.086	...	.086	.079	.086
c-l, drs ... lb.	...	.076	...	.076	.069	.076
tks ... lb.	...	.076	...	.076	.069	.076
Ethylhexyl, tks, wks ... lb.	.23	.25	.23	.25	.23	.23
Isopropyl, ref'd, 91% drs, frt all'd ... gal.	.40½	.43½	.40½	.43½	.40½	.43½
tks, frt all'd ... gal.	...	.34	.34	.34	.34	.34
99%, drs, frt all'd ... gal.	.44	.47	.44	.47	.44	.47
tks, frt all'd ... gal.	...	.37½	.37½	.37½	.37½	.37½
Octyl, see Ethylhexyl						
Polyvinyl A fib drs ... lb.	...	.54	.54	.54	.26	.54
B fib drs ... lb.	.65	.70	.65	.70	...	...
Propyl, nor, drs, wks gal.	.69	.75	.69	.75	...	...
Spec Solvents, East, drs, wks ... gal.	.67	.70	.67	.70	...	...
tks, East, wks ... gal.	.61	.66	.61	.66	...	...
Tetrahydrofurfuryl drs, f.o.b. wks ... lb.	.44	.50	.44	.50	...	...
Aldehyde ammonia, 100 gal drs ... lb.	.65	.70	.65	.70	.65	.70
Aldehyde Bisulfite, bbls, delv ... lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv ... lb.	.12	.15	.12	.15	.11	.15
Alphanaphthol, crude, 300 lb bbls ... lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls ... lb.	...	.32	...	.32	...	.32
Alum, ammonia, lump, c-l, bbls, wks ... 100 lb.	...	4.25	...	4.25	3.75	4.25
delv NY, Phila ... 100 lb.	...	4.25	...	4.25	3.75	4.25
Granular, c-l, bbls wks ... 100 lb.	...	4.00	...	4.00	3.50	4.00
Powd, c-l, bbls, wks 100 lb.	...	4.40	...	4.40	3.90	4.40
Potash, lump, c-l, bbls, wks ... 100 lb.	...	4.50	...	4.50	4.00	4.50
Granular, c-l, bbls, wks ... 100 lb.	...	4.25	...	4.25	3.75	4.25
Powd, c-l, bbls, wks 100 lb.	...	4.65	...	4.65	4.15	4.65
Soda, bbls, wks ... 100 lb.	...	3.25	...	3.25	...	3.25
Chrome, bbls ... 100 lb.	.12½	.15	.12½	.15	no prices	
Aluminum metal, c-l, (*FP*) ... 100 lb.	15.00	16.00	15.00	16.00	17.00	18.00
Acetate, 20%, nor sol, bbls ... lb.	.10½	.11	.10½	.11	.10½	.11
Basic powd, bbls, delv lb.	.40	.50	.40	.50	.35	.50
24% sol, bbls, delv lb.	.10½	.11	.10½	.11	.09½	.12
Chloride anhyd 99% wks lb.	.08	.12	.08	.12	.08	.12
Crystals, c-l, drs, wks lb.	.06	.06½	.06	.06½	.06	.06½
Solution, drs, wks ... lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv ... lb.	.13	.15	.13	.15	.13	.15
Hydrate, 96%, light, 90 lb. bbls, delv ... lb.	...	.14½	...	.14½	.12½	.14½
heavy, bbls, wks ... lb.	...	.034	...	.034	.029	.03½
Oleate, drs ... lb.	.24½	...	.17½	.26	.17½	.20
Palmitate, bbls ... lb.	.25	.26	.25	.26	.20½	.26
Resinate, pp., bbls ... lb.	...	.15½	.15	.15½	...	.15
Stearate, 100 lb bbls ... lb.	.22	.23	.22	.23	.18	.23
Sulfate, com, c-l, bgs, wks ... 100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
c-l, bbls, wks ... 100 lb.	1.35	1.45	1.35	1.45	1.35	1.45
Sulfate, iron-free, c-l, bgs, wks ... 100 lb.	1.75	1.85	1.75	1.85	1.60	1.85
c-l, bbls, wks ... 100 lb.	1.95	2.05	1.95	2.05	1.80	2.10
Ammonia anhyd fert com, tks lb.	.04½	.05	.04½	.05	.04½	.05
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16	...	.16
26°, 800 lb drs, delv ... lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH_3 cont.	...	.08z	...	.08z	.04	.05¼
Ammonium Acetate, kgs ... lb.	.27	.33	.27	.33	.27	.33
Bicarbonate, bbls, f.o.b. wks ... 100 lb	.0564	.0614	.0564	.0614	.0564	.0614
Bifluoride, 300 lb bbls ... lb.	.15½	.18	.15½	.18	.14	.18
Carbonate, tech, 500 lb bbls ... lb.	.08¼	.09¼	.08¼	.09¼	.08¼	.09¼
Chloride, White, 100 lb. bbls, wks ... 100 lb.	4.45	...	4.45	...	4.45	...
Gray, 250 lb bbls, wks ... 100 lb.	5.50	5.75	5.50	5.75	5.50	5.75
Lactate, 500 lb bbls ... lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls ... lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls ... lb.	...	.12	...	.12	...	.12
Nitrate, tech, bgs, bbls lb.	.0435	.0455	.0435	.0455	.0435	.0455
Oleate, drs ... lb.	...	.14	...	.14	...	.14
Oxalate, neut, cryst, powd, bbls ... lb.	.23	.29	.23	.29	.19	.29
Perchlorate, kgs ... lb.	.55	.65	.55	.65	.55	.65
Persulfate, 112 lb kgs lb.	.21	.23	.21	.23	.21	.22

z On a f.o.b. wks. basis.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Ammonium (continued):					
Phosphate, diabasic tech, powd, 325 lb bbls ... lb.	.07¼	...	.07¼	.09¼	.07¼	.09¼
Ricinoleate, bbls ... lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls ... lb.	...	.24½	...	.24½	...	.24½
Paste, bbls ... lb.	...	.06½	...	.06½	...	.06½
Sulfate, dom, f.o.b., bulk ton	29.00	30.00	29.00	30.00	29.00	30.00
Sulfocyanide, pure, kgs. lb.	.45	.55	.45	.55	.45	.65
Amyl Acetate (from pentane)						
tks, delv ... lb.	...	.145	...	.145	.105	.145
c-l, drs, delv ... lb.	...	.155	...	.155	.115	.155
lcl, drs, delv ... lb.	...	.165	...	.165	.125	.165
tech drs, ex-fusel oil delv lb.	...	.14½	...	.14½	...	.14½
Secondary, tks, delv ... lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv ... lb.	...	.09½	...	.09½	...	.09½
tks, delv ... lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks lb.	.56	.68	.56	.68	.56	.68
mixed l c l drs, wks lb.	...	.08	...	.08	.0565	.08
tks, wks ... lb.	...	.06	...	.06	.0465	.06
Amyl Ether (see Diamyl						
lcl, dms ... lb.	...	.102	...	.102	...	...
cl, dms ... lb.	...	.095	...	.095	...	...
tks ... lb.	...	.085	...	.085	...	...
Mercaptan, drs, wks ... lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs ... lb.	...	.31	...	.31	.25	.31
Stearate, lcl, wks, drs .. lb.	...	.32½	...	.32½	.26	.335
Amylene, drs, wks ... lb.	.102	.11	.102	.11	.102	.11
tks, wks ... lb.	...	.09	...	.09	...	.09
Amylnaphthalenes, see Mixed Amylnaphthalenes						
Aniline Oil, 960 lb drs and tks ... lb.	...	.14½	...	.14½	...	.14½
Annatto fine ... lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80-85% ... lb.	...	.55	...	.55	...	.55
Anthraquinone, sublimed, 125 lb bbls ... lb.	...	.70	...	.70	.65	.70
Antimony metal slabs, ton lots ... lb.	.14½	...	.14	.14½	.14	.16½
Butter of, see Chloride						
Chloride, soln, cbys ... lb.	...	.17	...	.17	...	.17
Needle, powd, bbls ... lb.	.18½	.20	.18½	.20	.16	.18
Oxide, 500 lb bbls ... lb.	.15	.16½	.15	.16½	.12	.16½
Salt, 63% to 65%, drs lb.	...	.34	...	.34	.28	.34
Archil, conc, 600 lb bbls lb.	...	.26	...	.26	no prices	
Aroclors, wks ... lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls ... lb.	.10¼	.10¾	.10¼	.10¾	.09½	.10¾
Arsenic, Metal ... lb.	no prices		no prices		no prices	
Red, 224 lb cs kgs ... lb.	no prices		no prices		no prices	
White, 112 lb kgs ... lb.	.04	.04¾	.04	.04¾	.03½	.04¾
B						
Barium Carbonate precip, 200 lb bgs, wks ... ton	55.00	65.00	55.00	65.00	45.00	65.00
Nat (witherite) 90% gr, c-l, wks, bgs ... ton	...	43.00	...	43.00	...	43.00
Chlorate, 112 lb kgs, NY lb.	...	.60	...	.60	...	.45
Chloride, 600 lb bbls, delv, zone 1 ... ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs lb.	...	.10	...	.10	...	.10
Hydrate, 500 lb bbls ... lb.	.06	.07	.06	.07	.05½	.07
Nitrate, bbls ... lb.	.10½	.12½	.10½	.12½	.08½	.12½
Barytes, floated, 350 lb bbls c-l, wks ... ton	...	27.65	...	27.65	25.15	27.65
Bauxite, bulk, mines ... ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks ... ton	...	16.00	...	16.00	...	16.00
200 mesh ... ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks ... lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	...	.15	...	.15	.14	.15
90% c-l, drs ... gal.	...	.20	...	.20	.19	.20
Ind pure, tks, frt all'd gal.	...	.15	...	.15	.14	.15
Benzidine Base, dry, 250 lb. bbls ... lb.	...	.70	...	.70	...	.70
Benzoyl Chloride, 500 lb drs lb.	.23	.28	.23	.28	.23	.28
Benzyl Chloride, 95-97% rfd, drs ... lb.	.22	.24	.22	.24	.19	.24
Beta-Naphthol, 250 lb bbls, wks ... lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls ... lb.	1.25	...	1.25	...	1.25	1.35
Tech, 200 lb bbls ... lb.	...	.51	...	.51	.51	.52
Bismuth metal ... lb.	...	1.25	...	1.25	...	1.25
Chloride, boxes ... lb.	...	3.00	...	3.00	3.00	3.25
Hydroxide, boxes ... lb.	3.35	3.46	3.35	3.46	3.35	3.46
Oxychloride, boxes ... lb.	3.10	3.19	3.10	3.19	3.10	3.19
Subbenzoate, boxes ... lb.	...	3.40	...	3.40	...	3.40
Subcarbonate, kgs ... lb.	1.59	1.85	1.59	1.85	1.59	1.85
Subnitrate, fibre, drs ... lb.	1.29	1.57	1.29	1.57	1.20	1.57
Trioxide, powd, boxes .. lb.	...	3.65	...	3.65	...	3.65
Blanc Fixe, Pulp, 400 lb. bbls, wks ... ton *h*	40.00	46.50	40.00	46.50	35.00	46.50
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	2.25	3.10	2.25	3.10	2.00	3.10
lcl, drs, wks ... lb.	2.50	3.35	2.50	3.35	2.25	3.35
Blood, dried, f.o.b., NY unit	...	5.50	5.25	5.50	4.75	5.25
Chicago, high grade .. unit	5.70	...	5.40	5.80	5.00	5.40
Imported shipt ... unit	5.25	nom.	5.00	5.35	4.75	5.00
Blues, Bronze Chinese ...						
Prussian Soluble ... lb.	...	.36	...	.36	.33	.36
Milori, bbls ... lb.	...	.36	...	.36	.33	.36
Ultramarine,* dry, wks, bbls ... lb.	...	.11	...	.11	...	.11
Regular grade, group 1 lb.	.16	.27	.16	.27	.16	.20
Pulp, Cobalt grade ... lb.	.23	.27	.22	.27	.22	.24

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

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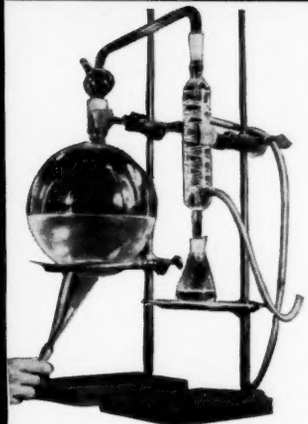

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Methanol—Methyl Acetone
Methyl Acetate
Formaldehyde
Denatured Alcohol
Turpentine
Rosin
Benzol
Toluol
Xylol
Whiting
Magnesium Carbonate
Magnesium Oxide
Precipitated Chalk

Anti-Freeze—Methanol and Alcohol

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Bone, 4½ + 50% raw, Chicago ton	39.00	40.00	39.00	40.00	30.00	40.00
Bone Ash, 100 lb kgs lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50% imp ton	...	37.50	...	37.50	31.50	37.50
Domestic, bgs, Chicago ton	38.00	40.00	38.00	40.00	32.00	40.00
Borax, tech, gran, 80 and 40 ton lots, bgs, delv ..ton *i*	...	46.00	45.00	46.00	43.00	45.00
bbls, delv (*FP*) ton *i*	...	55.00	54.00	55.00	53.00	56.00
Tech, powd, 80 and 40 ton lots, bgs ton	...	51.00	50.00	51.00	48.00	50.00
bbls, delv ton	...	60.00	59.00	60.00	58.00	61.00
Bordeaux Mixture, drs lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases lb.	.25	.30	.25	.30	.25	.30
Bronze, Al, pwd, 300 lb drs (*FP*) lb.	...	.59	...	.59	...	.57
Gold, blk lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3 tks lb.	...	.02½	...	.02½	.02½	.03
Butyl, acetate, norm drs, frt all'd lb.	.14½	.168	.14½	.168	.10	.168
tks, frt all'd lb.	.13½	.158	.13½	.158	.09	.158
Secondary, tks, frt all'd lb.	...	.08½	...	.08½	.07¼	.08½
drs, frt all'd lb.	...	.09½	...	.09½	.08¾	.09½
Aldehyde, 50 gal drs, wks lb.	.14½	.16½	.14½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)						
Chloride, normal lcl, drs lb.	...	.35	.28	.35	...	...
c-l, drs lb.	...	.32	.25	.32	...	...
Crotonate, norm, 55 and 110 gal drs, delv lb.	...	.35	...	.35	...	.35
Lactate lb.	...	.26½	...	.26½	...	.23½
Oleate, drs, frt all'd lb.	...	.25	...	.25	...	.25
Propionate, drs lb.	.16½	.17	.16½	.17	.16½	.17
tks, delv lb.	...	.15½	...	.15½	...	.15½
Stearate, 50 gal drs lb.	...	.31	...	.31	.28½	.32½
Tartrate, drs lb.	no prices		no prices		.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½

C

Cadmium Metal lb.	.90	.95	.90	.95	.80	.95
Sulfide, orange, boxes lb.	...	1.10	...	1.10	...	1.10
Calcium, Acetate, 150 lb bgs c-l, delv 100 lb.	3.00	4.00	3.00	4.00	1.90	4.00
Arsenate, c-l, E of Rockies, dealers, drs lb.	.07	.08	.06½	.08	.06	.07½
Carbide, drs lb.	...	.04¼	...	.04¼	...	.04¼
Carbonate, tech, 100 lb bgs, c-l ton	16.00	20.00	16.00	20.00	16.00	20.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv ton	...	21.00	...	21.00	...	20.50
paper bgs, c-l, delv ton	18.50	41.00	18.50	41.00	18.50	35.00
Solid, 650 lb drs, c-l, delv ton	18.00	34.50	18.00	34.50	18.00	34.50
Ferrocyanide, 350 lb bbls wks lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls lb.	.52	.59	.52	.59	.52	.59
Levulinate, less than 25 bbl lots, wks lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bgs ton	no prices		no prices		no prices	
Palmitate, bbls lb.	.28	.29	.28	.29	.22	.29
Phosphate, tribasic, tech, 450 lb bbls lb.	.0635	.0705	.0635	.0705	.0635	.0705
Resinate, precip, bbls lb.	.15	.16	.13	.16	.13	.14
Stearate, 100 lb bbls lb.	.26	.27	.26	.27	.20½	.27
Camphor, slabs lb.	1.60	1.65	1.60	1.65	.73	1.65
Powder lb.	1.60	1.65	1.60	1.65	.63	1.65
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b. plants lb.	...	.03625	...	.03625	.03325	.0342
Decolorizing, drs, c-l lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq, 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, (*FP*) (*PC*) 55 or 110 gal drs, c-l, delv lb.	...	.73	...	.73	.66½	.73
Casein, Standard, Dom, grd lb.	.17½	.18½	.17½	.30½	.11½	.31
80-100 mesh,c-l bgs lb.	.18	.19	.18	.31	.12	.31½
Castor Pomace, 5½ NH_3, c-l, bgs, wks ton	...	19.00	16.00	19.00	15.00	16.00
Imported, ship, bgs ton	no prices		no prices		no prices	
Celluloid, Scraps, ivory cs lb.	.13	.15	.13	.15	.12	.15
Transparent, cs lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, frt all'd, 50 lb kgs lb.	...	.30	...	.30	...	.30
Triacetate, flake, frt all'd lb.	...	.30	...	.30	...	.30
Chalk, dropped, 175 lb bbls lb.	...	.02½	...	.02½	.02¾	.02½
Precip, heavy, 560 lb cks 100 lbs.	...	32.50	32.50	32.50	32.50	32.50
Charcoal, Hardwood, lump, blk, wks bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ton	25.00	36.00	25.00	36.00	25.00	36.00
Willow, powd, 100 lb bbls, wks lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks lb.	...	.0225	...	.0225	.01¾	.0275
25%, bbls, wks lb.	...	.0275	...	.0275	.0240	.0275
China Clay, c-l, blk mines ton	...	7.60	...	7.60	...	7.60
Imported, lump, blk ton	19.00	24.00	18.60	24.00	18.60	...
Chlorine, cyls, lcl, wks, contract (*FP*) lb.	...	.07¼	...	.07¼	...	.07¼
cyls, c-l, contract lb. *j*	...	.05¼	...	.05¼	...	.05¼

j A delivered price; * Depends upon point of delivery.
(*FP*) Full Priority. (*PC*) Price Ceiling.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Chlorine (continued):					
Liq, tk, wks, contract 100 lb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks, cont lb.	...	2.00	...	2.00	1.90	2.00
Chloroacetophenone, tins, wks lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb. drs, lcl, wks lb.	...	.08	...	.08	.06	.08
Chloroform, tech, 650 lb drs lb.	...	.20	...	.20	...	.20
USP, 650 lb drs lb.	...	.30	...	.30	...	.30
Chloropicrin, comml cyls lb.	...	.80	...	.80	...	.80
Chrome, Green, CP lb.	.23	.33	.23	.33	.21	.25
Yellow lb.	.16	.17	.16	.17	.13½	.14½
Chromium Acetate, 8% Chrome, bbls lb.	.07¾	.08½	.07¾	.08½	.07¾	.08½
Fluoride, powd, 400 lb bbls lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls bbl.	7.50	7.75	7.50	7.75	7.50	7.75
Cobalt Acetate, bbls (A) lb.	...	.83¾	...	.83¾	.80½	.83¾
Carbonate tech, bbls (A) lb.	...	1.58	...	1.58	...	1.58
Hydrate, bbls (A) lb.	...	2.04	...	2.04	1.98	2.04
Linoleate, solid, bbls lb.	...	.42	...	.42	.33	.42
paste, 5%, drs lb.	...	.31	...	.31	...	.31
Oxide, black, bgs (A) lb.	...	1.84	...	1.84	...	1.84
Resinate, fused, bbls lb.	...	.13½	...	.13½	...	.13½
Precipitated, bbls lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs lb.	.38	.39	.38	.39	.38	.39
Copper, metal *FP*, *PC* 100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Acetate, normal, bbls, delv lb.	.24	.26	.24	.26	.22	.26
Carbonate, 52-54% 400 lb bbls lb.	.18	.20½	.18	.20½	.1650	.20½
Chloride, 250 lb bbls lb.	...	.23¼	.19½	.23¼	.16	.19½
Cyanide, 100 lb drs lb.	.34	.38	.34	.38	.34	.38
Oleate, precip, bbls lb.	.22	.28½	.20	.28½	...	.20
Oxide, black, bbls, wks lb.	.19½	.21	.19½	.21	.18	.21
red 100 lb bbls lb.	.20	.22	.20	.22	.19	.22
Sub-acetate verdigris, 400 lb bbls lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks, 100 lb.	5.15	5.50	5.15	5.50	4.75	5.50
Copperas crys and sugar bulk c-l, wks ton	...	17.00	...	17.00	14.00	17.00
Corn sugar, tanners, bbls 100 lb.	...	3.54	3.54	4.05	3.36	4.05
Corn Syrup, 42°, bbls 100 lb.	...	3.69	3.52	3.69	3.42	3.52
43°, bbls 100 lb.	...	3.74	3.57	3.74	3.47	3.57
Cotton, Soluble, wet 100 lb bbls lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls lb.	...	.57½	...	.57½	.38¼	.57½
Creosote, USP 42 lb cbys lb.	.60	.77	.60	.77	.45	.77
Oil, Grade 1 tks gal.	...	.15½	...	.15½	.13½	.15½
Grade 2 gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs, c-l lb.	.10¾	.11¼	.10¾	.11½	.09¾	.11¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks lb.	...	.15	...	.15	.11	.15
Cutch, Philippine, 100 lb bale lb	no supplies		...	.05¼	.04¾	.05¼
Cyanamid, pulv, bgs, c-l, frt all'd, nitrogen basis, unit	no prices		no prices		...	1.40

D

Derris root 5% rotenone, bbls lb.	...	.35	.40	.45	.21	.40
Dextrin, corn, 140 lb bgs f.o.b., Chicago 100 lb.	...	4.00	...	4.00	3.80	4.00
British Gum, bgs 100 lb.	...	4.25	...	4.25	4.05	4.25
Potato, Yellow, 220 lb bgs lb.	...	.10	.09½	.10	.08	.08½
White, 220 lb bgs, lcl lb.	.09½	.11¾	.09½	.11¾	.08½	.09
Tapioca, 200 bgs, lcl lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs 100 lb.	...	3.95	...	3.95	3.75	3.95
Diamylamine, c-l, drs, wks lb.	...	.61	.50	.61	.47	.50
lcl drs, wks lb.	...	.64	.53	.64	.48	.53
Diamylene, drs, wks lb.	...	.105	...	.105	.095	.105
lcl, drs lb.	...	.112	...	.112	...	...
tks, wks lb.	...	.09½	...	.09½	.08½	.09½
Diamylether lb.	...	...	...	...	.085	.102
lcl, drs lb.	...	.112	.102	.112	...	...
c-l, drs lb.	...	.105	.095	.105	...	...
tks lb.	...	.095	.085	.095	...	...
Diamylnaphthalene, lcl, drs, f.o.b. wks lb.	...	.17	...	.17	.17	.20
Diamylphenol, lcl, drs lb.	...	.21	...	.21	...	...
Diamylphthalate, drs, wks lb.	...	.22	.21	.22	.21	.21½
Diamyl Sulfide, drs, lcl lb.	...	.25	...	.25	...	...
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	...	.64	.53	.64	...	.53
c-l, drs, wks lb.	...	.61	.50	.61	...	.50
tks, wks lb.	...	.48	...	.48	...	.48
Dibutyl Ether, drs, wks, lcl lb.	.26	.28	.26	.28	.25	.28
Dibutylphthalate, drs, wks, frt all'd lb.	.21	.23	.21	.23	.19	.20
Dibutyltartrate, 50 gal drs lb.	...	.87	...	.87	.50	.87
Dichlorethylene, drs lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks lb.	.15	.16	.15	.16	.15	.16
tks, wks lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, c-l, drs lb.	...	.037	...	.037	.025	.04
lcl, drs lb.	...	.045	...	.045	...	...
tks, wks lb.	...	.03	...	.03	.0221	.025
Diethanolamine, tks ,wks lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks lb.	...	.81	.70	.81	...	.70

* These prices were on a delivered basis.

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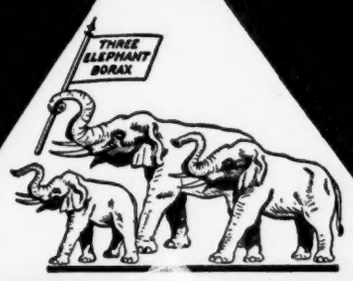

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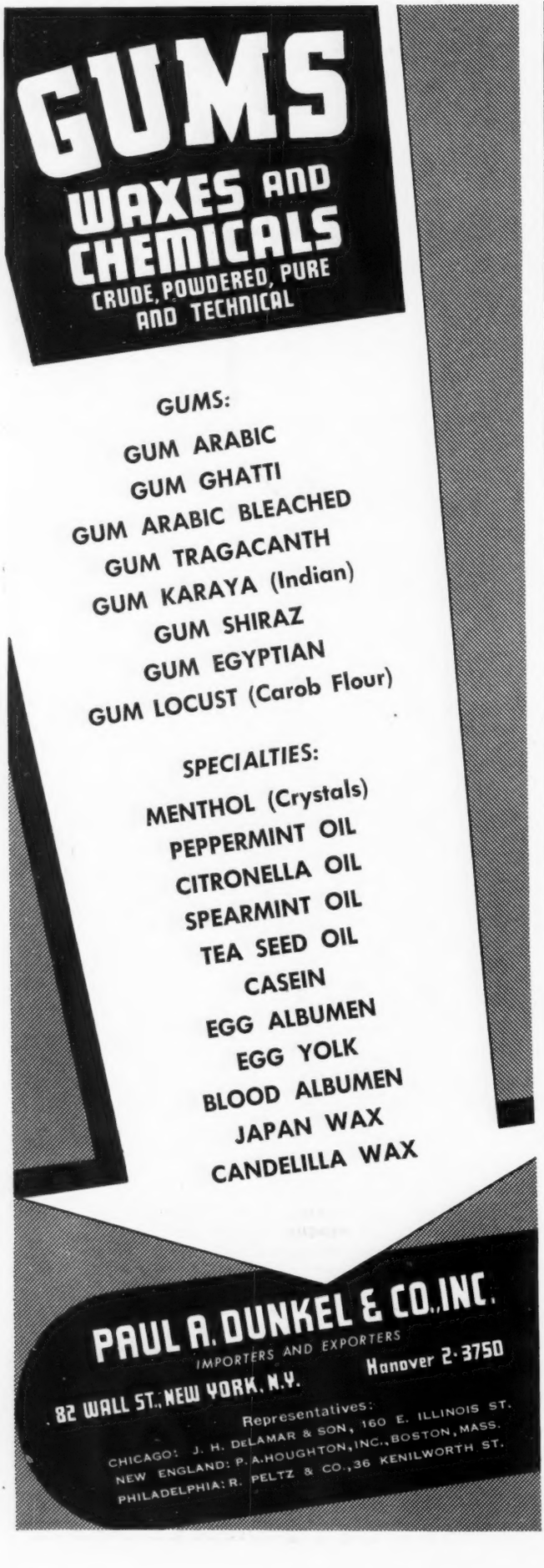

Diethylamino Ethanol
Ferric Chloride

Prices

		Current Market		1942 Low	1942 High	1941 Low	1941 High
Diethylamino Ethanol, lcl, drs, f.o.b. Wyandotte, frt all'd E. Miss	lb.	...	.85	.75	.85	...	.75
Diethylaniline, 850 lb drs	lb.	...	.40	...	.40	...	.40
Diethylcarbonate, com drs	lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs	lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, c-l, drs	lb.	...	.22	.21½	.22	.19	.20
Diethylsulfate, tech, drs, wks, lcl	lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs	lb.	.14	.15½	.14	.15½	.14	.15½
Mono ethyl ether, drs	lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks	lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs	lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks	lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks	lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls	lb.	.31	.33	.16	.33	...	.16
Oleate, bbls	lb.	...	.17	...	.17	...	.17
Stearate, bbls	lb.	...	.22	...	.22	...	.22
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis	lb.	.85	.90	.85	.90	.85	1.05
Dimethylaniline, 240 lb drs	lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs, wks, frt all'd	lb.	...	.20	...	.20	.18½	.20
Dimethylsulfate, 100 lb drs	lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls	lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, 400 lb bbls	lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls	lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls	lb.	...	.22	...	.22	...	.22
Dinitrotoluene, 300 lb bbls	lb.	...	.18	...	.18	.15½	.18
Diphenyl, bbls	lb.	...	.15	...	.15	.15	.20
Diphenylamine	lb.	...	.25	...	.25	...	.25
Diphenylguanidine, 100 lb drs	lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.							
Divi Divi pods, bgs shipmt	ton	...	80.00	55.00	80.00	32.00	52.00
Extract	lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).							

E

Egg Yolk, dom., 200 lb. cases	lb.	.87	.92	.87	1.05	.60	1.05
Epsom Salt, tech, 300 lb bbls c-l, NY	100 lb.	...	1.90	...	1.90	...	1.90
USP, c-l, bbls	100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs	lb.	.60	.61	.52	.61	.26	.53
Isopropyl 50 gal drs	lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd	lb.	...	.06	...	.06	...	.06
Nitrous conc bottles	lb.	.93	1.10	.73	1.10	...	.73
Synthetic, wks, tks	lb.	...	.08	.08	.10	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd	lb.	.11	.12	.11	.12	.06½	.12
drs, frt all'd	lb.	.12	.13	.12	.13	.07½	.13
99%, tks, frt all'd	lb.	.11¼	.12¼	.11¼	.12¼	.06¾	.12¼
drs, frt all'd	lb.	.12¼	.13¼	.12¼	.13¼	.07¾	.13¼
Acetoacetate, 110 gal drs	lb.	...	.37½	...	.37½	.27½	.37½
Benzylaniline, 300 lb drs	lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs	lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd	lb.	.50	.60	.50	.60	.45	.50
Chloride, 200 lb drs	lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys	lb.	...	.30	...	.30	...	.30
Crotonate, drs	lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd	lb.	...	.27¾	...	.27¾	.25	.27¾
Lactate, drs, wks	lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks	lb.	...	.33	...	.33	.25	.33
Silicate, drs, wks	lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs	lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont	lb.	.75	.85	.75	.85	.75	.85
Anhydrous	lb.	...	.75	...	.75	...	.75
Dichloride, (*FP*) 50 gal drs, E. Rockies	lb.	...	.0742	...	.0742	.0693	.0746
Glycol, 50 gal drs, wks	lb.	.14½	.18½	.14½	.18½	.14½	.18½
tks, wks	lb.	...	.13½	...	.13½	...	.13½
Mono Butyl Ether, drs, wks	lb.	.16½	.17½	.16½	.17½	.16½	.17½
tks, wks	lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks	lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks	lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks	lb.	.11½	.12½	.11½	.12½	.11½	.12½
tks, wks	lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks	lb.	.15½	.16½	.15½	.16½	.15½	.16½
tks, wks	lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl	lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline	lb.	.45	.47½	.45	.47½	.45	.47½

F

Feldspar, blk pottery	ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks	ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, 475 lb bbls	lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys	lb.	.06½	.07	.06½	.07	.06½	.07

l + 10; *m* + 50; * Bbls. are 20c higher.
FP Full Priority. *PC* Price Ceiling.

Current

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Fish Scrap, dried, unground wks (*PC*) ....unit *l*	nominal	4.75	4.85	4.35	4.85
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ....unit *m*	nominal	2.75	3.25	2.75	3.25
Fluorspar, 98% bgs ....ton	... 32.00	32.00	34.00	29.00	34.00
Formaldehyde, c-l, bbls, wks (*FP, PC*) ....lb.	.055 .0575	.055	.0575	...	...
Fossil Flour ....lb.	.02½ .04	.02½	.04	.02½	.04¼
Fullers Earth, blk, mines ton	8.50 15.00	8.50	15.00	8.50	15.00
Imp powd, c-l, bgs ....ton	30.00 40.00	30.00	40.00	no prices	
Furfural (tech) drs, wks lb.	... .15	...	.15	.10	.15
tks, wks ....lb.	... .09	...	.09	...	.09
Furfuramide (tech) 100 lb drs ....lb.	... .30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.18 .18½	.18	.18½	.16	.19½
Fustic, crystals, 100 lb boxes ....lb.	.28 .32	.28	.32	.24	.32
Liquid 50°, 600 lb bbls lb.	.12½ .16	.12½	.16	.10½	.16
Solid, 50 lb boxes ....lb.	.19 .21	.19	.21	.19	.21
G					
G Salt paste, 360 lb bbls ..lb.	... .45	...	.45	...	.45
Gambier, com 200 lb bgs lb.	no prices	...	.09½	.06½	.09½
Singapore cubes, 150 lb bgs ....100 lb.	.13 nom.	.12½	.13	.08¼	.11
Glauber's Salt, tech, c-l, bgs, wks ....100 lb.	1.05 1.28	1.05	1.28	.95	1.28
Anhydrous, see Sodium Sulfate					
Glue, bone, com grades, c-l bgs ....lb.	.15½ .18½	.15½	.18½	.13½	.18½
Better grades, c-l, bgs lb.	.19 .30	.19	.30	.15	.30
Glycerin (*PC*) CP, drs ...lb.	... .18¾	...	.18¾	.14½	.19½
Dynamite, 100 lb drs ...lb.	... .18¼	...	.18¼	...	.18¼
Saponification, drs ....lb.	... .12¾	...	.12¾	.09½	.20½
Soap Lye, drs ....lb.	... .11½	...	.11½	.07⅛	.18
Glyceryl Bori-Borate, bbls lb.	... .40	...	.40	...	.40
Monoricinoleate, bbls ...lb.	... .27	...	.27	...	.27
Monostearate, bbls ....lb.	... .30	...	.30	...	.30
Oleate, bbls ....lb.	... .22	...	.22	...	.22
Phthalate ....lb.	... .38	...	.38	...	.38
Glyceryl Stearate, bbls ...lb.	... .18	...	.18	...	.18
Glycol Bori-Borate, bbls ..lb.	... .22	...	.22	...	.22
Phthalate, drs ....lb.	... .38	...	.38	...	.38
Stearate, drs ....lb.	... .26	...	.26	...	.26
GUMS					
Gum Aloes, Barbadoes ...lb.	.80 .85	.80	.85	.80	.95
Arabic, amber sorts ....lb.	.21 .23	.21	.24	.14	.25
White sorts, No. 1, bgs lb.	.33 .35	.33	.35	.35	.45
Powd, bbls ....lb.	.26 .28	.26	.28	.18	.30
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY ....lb.	.04½ .05½	.04½	.05½	.04½	.05½
California, f.o.b. NY, drs ton	35.00 40.00	20.00	40.00	20.00	36.50
Egyptian, 200 lb cases, f.o.b. NY ....lb.	.12 .15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases ....lb.	.50 .55	.45	.55	.19	.50
Copal, Congo, 112 lb bgs, clean, opaque ....lb.	... .49½	...	.49½	...	.49½
Dark amber ....lb.	... .12¾	...	.12¾	...	.12¾
Light amber ....lb.	... .17	...	.17	...	.17
Copal, East India, 180 lb bgs Macassar pale bold ....lb.	... .17⅜	...	.17⅜	.12¾	.17⅜
Chips ....lb.	... .11½	...	.11½	.06¾	.11½
Dust ....lb.	... .07	...	.07	.05¼	.07
Nubs ....lb.	... .13⅜	...	.13⅜	.10½	.13⅜
Singapore, Bold ....lb.	... .22⅜	...	.22⅜	.15¾	.22⅜
Chips ....lb.	... .12⅜	...	.12⅜	.08½	.12⅜
Dust ....lb.	... .07	...	.07	.05¼	.07
Nubs ....lb.	... .17¾	...	.17¾	.11	.17¾
Copal Manila, 180-190 lb	... .14	...	.14	.13⅜	.14
Loba B ....lb.	... .14¼	...	.14¼	.11¾	.14¼
Loba C ....lb.	... .13⅜	...	.13⅜	.11¼	.13⅜
DBB ....lb.	... .12¼	...	.12¼	.10	.12¼
MA sorts ....lb.	... .10¼	...	.10¼	.07¾	.10¼
Copal Pontianak, 224 lb cases, bold genuine ..lb.	... .22⅞	...	.22⅞	.15⅜	.22⅞
Chips ....lb.	... .14½	...	.14½	.10	.14½
Mixed ....lb.	... .17⅜	...	.17⅜	.14⅜	.17⅜
Nubs ....lb.	... .18⅞	...	.18⅞	.12¾	.18⅞
Split ....lb.	... .19⅜	...	.19⅜	.13¾	.19⅜
Damar Batavia, 136 lb cases A ....lb.	... .35¼	...	.35¼	.21⅝	.35¼
B ....lb.	... .34⅜	...	.34⅜	.20¼	.34⅜
C ....lb.	... .28⅝	...	.28⅝	.14⅝	.28⅝
D ....lb.	... .25⅜	...	.25⅜	.13¼	.25⅜
A/D ....lb.	... .28⅜	...	.28⅜	.15¼	.28⅜
A/E ....lb.	... .25⅜	...	.25⅜	.12⅞	.25⅜
E ....lb.	... .18¾	...	.18¾	.10	.18¾
F ....lb.	... .13¾	...	.13¾	.08	.13¾
Singapore, No. 1 ....lb.	... .30⅝	...	.30⅝	.16⅝	.30⅝
No. 2 ....lb.	... .25⅜	...	.25⅜	.12¼	.25⅜
No. 3 ....lb.	... .12⅜	...	.12⅜	.07⅜	.12⅜
Chips ....lb.	... .23½	...	.23½	.11	.23½
Dust ....lb.	... .13	...	.13	.07⅛	.13
Seeds ....lb.	... .17¾	...	.17¾	.09⅞	.17¾
Elemi, cns, c-l ....lb.	... .08⅞	...	.08⅞	.08½	.08⅞
Ester ....lb.	.08½ .09½	.08½	.09½	.06¼	.09½
Gamboge, pipe, cases ....lb.	2.30 2.35	.95	2.35	.95	1.00
Powd, bbls ....lb.	2.50 2.55	1.05	2.55	1.05	1.10
Ghatti, sol, bgs ....lb.	.11 .15	.11	.15	.11	.15
Karaya, bbls, bxs, drs ...lb.	.14 .33	.14	.33	.14	.33

FP Full Priority. *PC* Price Ceiling.

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PHOSPHORIC (U.S.P.) ACID

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PHOSPHORUS OXYCHLORIDE

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PHOSPHORUS PENTACHLORIDE

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PHOSPHORUS PENTASULFIDE

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PHOSPHORUS TRICHLORIDE

Plant and Main Office:
Niagara Falls, New York

New York Office: 22 E. 40th St., New York City

Kauri, NY
Logwood

Prices

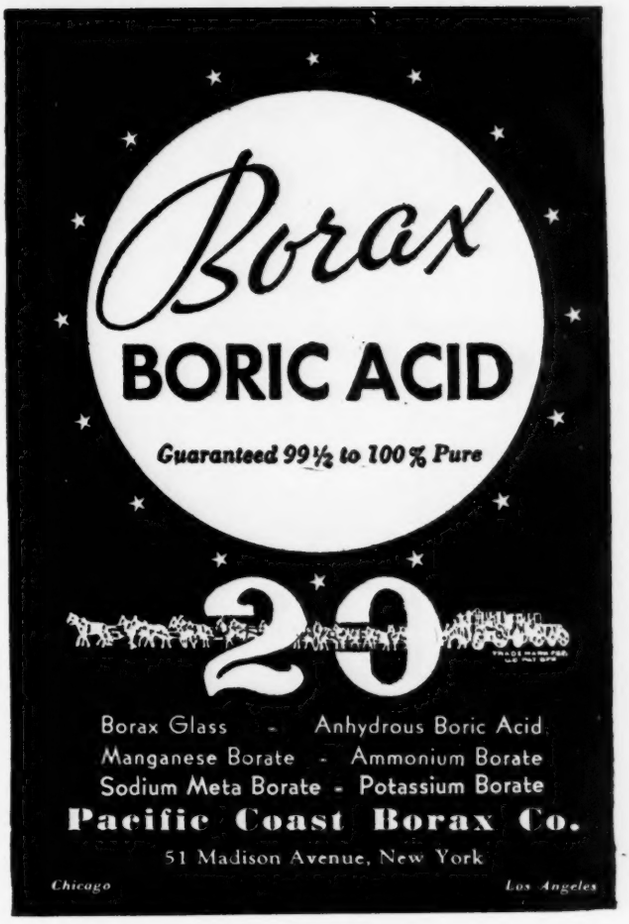
		Current Market	1942 Low	1942 High	1941 Low	1941 High
Kauri, N Y						
Brown XXX, cases	lb.	...	.67	.60	.67	... .60
BX	lb.	...	.38	.	.38	... .38
B1	lb.	...	.34	.28	.34	... .28
B2	lb.	...	.30	.24	.30	... .24
B3	lb.	...	.27½	.18½	.27½	... .18½
Pale XXX	lb.	...	.66	.61	.66	... .61
No. 1	lb.	...	.43	.41	.43	... .41
No. 2	lb.	...	.31	.24	.31	... .24
No. 3	lb.	...	.22	.17¾	.22	... .17¾
Kino, tins	lb.	no prices		no prices		no prices
Mastic	lb.	3.25	3.30	3.25	3.30	1.50 3.30
Sandarac, prime quality, 200 lb bgs & 300 lb cks	lb.	1.00	1.10	1.00	1.10	.50 1.10
Senegal, picked bgs	lb.	...	.30	...	.30	... .30
Sorts	lb.	...	.13	...	.13	... .13
Thus, bbls	280 lbs.	...	16.50	...	16.50	15.00 16.50
Tragacanth, No. 1, cases	lb.	3.75	4.00	3.50	4.00	2.75 3.40
No. 2	lb.	2.00	3.00	2.00	3.00	2.45 2.80
No. 3	lb.	1.10	1.20	1.10	1.20	1.10 2.60
Yacca, bgs	lb.	.06½	.07¾	.06½	.07¾	.03½ .07¾
H						
Hematine crys, 400 lb bbls	lb.	.24	.34	.24	.34	.20 .34
Hemlock, 25%, 600 lb bbls wks	lb.	nom.	.03½	nom.	.03½	.03½ .03½
tks	lb.	nom.	.03	nom.	.03	.02¾ .03
Hexalene, 50 gal drs, wks	lb.	...	.23	...	.23	.23 .30
Hexane, normal 60-70° C. Group 3, tks (*PC*)	gal.	...	.11	...	.11	.09¾ .11
Hexamethylenetetramine, powd, drs (*FP*)	lb.	.32	.33	.32	.33	.32 .33
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13	.13½	.13 .13½
tks	lb.	...	.12	...	.12	... .12
Hoof Meal, f.o.b. Chicago unit		4.00	4.25	3.00	4.25	2.65 3.05
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.16	.18½	.16	.18½	.16 .18½
Hydroxylamine Hydrochloride	lb.	...	3.15	...	3.15	... 3.15
Hypernic, Bags, No. 1	lb.	...	.42	...	.42	.40 .42
I						
Indigo, Bengal, bbls	lb.	2.14	2.20	2.14	2.20	1.63 2.20
Synthetic, liquid	lb.	.16½	.19	.16½	.19	.16½ .19
Iodine, Resublimed, jars	lb.	...	2.00	...	2.00	... 2.00
Irish Moss, ord, bales	lb.	.37	.42½	.30	.42½	.25 .31
Bleached, prime, bales	lb.	.80	.85	.80	.85	.32 .46
Iron Acetate Liq. 17°, bbls delv	lb.	.03	.04	.03	.04	.03 .04
Chloride see Ferric Chloride						
Nitrate, coml, bbls	100 lb.	3.50	4.00	3.50	4.00	3.50 4.00
Isobutyl Carbinol (128-132°C) drs, frt all'd	lb.	...	.23½	...	.23½	.22½ .23½
tks, frt all'd	lb.	...	.21½	...	.21½	... .21½
Isopropyl Acetate, tks, frt all'd	lb.	...	.10	.076	.10	.06½ .07½
drs, frt all'd, c-l	lb.	...	.12	.086	.12	.07½ .08½
Ether, see Ether, isopropyl						
K						
Keiselguhr, dom bags, c-l, Pacific Coast	ton	22.00	25.00	22.00	25.00	22.00 25.00
L						
Lead Acetate, f.o.b. NY, bbls, White, broken	lb.	...	.13¼	.12	.13¼	.11 .12½
cryst, bbls	lb.	...	.13¼	.12	.13¼	.11 .12½
gran, bbls	lb.	...	.14	.12¾	.13¼	.11¾ .13¼
powd, bbls	lb.	...	.14	.12¾	.13¼	.11¾ .13¼
Arsenate, East, drs	lb.	.11	.12	.11	.12	.09 .11
Linoleate, solid, bbls	lb.	.20½	.22¼	.19	.22¼	... .19
Metal, c-l, NY (*FP*) 100	lb.	5.85	5.90	5.85	5.90	5.70 5.90
Nitrate, 500 lb bbls, wks	lb.	.11	.14	.11	.14	.11 .14
Oleate, bbls	lb.	.18½	.20	.18½	.20	.18½ .20
Red, dry, 95% Pb_3O_4, delv	lb.	...	.09	...	.09	.08 .08¾
97% Pb_3O_4, delv	lb.	...	.09¾	...	.09¾	.084 .086
98% Pb_3O_4, delv	lb.	...	.09½	...	.09½	.0865 .0885
Resinate, fused, bbls	lb.	...	.09½	...	.09½	.09½ .16½
Stearate, bbls	lb.	...	.25	...	.25	... .25
Titanate, bbls, c-l, f.o.b. wks, frt all'd	lb.	...	.10¼	...	.10¼	... .10¼
White, 500 lb bbls, wks,	lb.	...	.07½	...	.07½	... .07½
Basic sulfate, 500 lb bbls, wks	lb.	...	.07½	.06314	.07½	.06½ .07
Lecithin, ed, dms, cl	lb.	...	.34	...	...	... ...
tech, dms, cl	lb.	...	.28	...	...	... ...
Lime, chemical quicklime, f.o.b. wks, bulk	ton	7.00	13.00	7.00	13.00	7.00 13.00
Hydrated, f.o.b. wks	ton	8.50	16.00	8.50	16.00	8.50 16.00
Lime Salts, see Calcium Salts						
Lime, sulfur, dealers, tks	gal.	no prices		.07½	.08½	... .07½
drs	gal.	no prices		.10	.14	.10 .14
Linseed Meal, bgs	ton	...	33.50	33.50	34.00	23.00 33.00
Litharge, coml, delv, bbls	lb.	...	.0790	...	.0790	.07 .0760
Lithopone, dom, ordinary, (*PC*). delv, bgs	lb.	...	.04¼	...	.04¼	.0385 .04¼
bbls	lb.	...	.04½	...	.04½	.041 .04½
Titanated, bgs	lb.	...	.056	...	.056	.05¼ .056
bbls	lb.	...	.0585	...	.0585	.05½ .0585
Logwood, 51°, 600 lb bbls	lb.	...	.13	...	.13	.10½ .13
Solid, 50 lb boxes	lb.	...	.22	...	.22	.16½ .22

(*FP*) Full Priority. (*PC*) Price Ceiling.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
M					
Madder, Dutch ..... lb.	.24	.22	.30	.22	.25
Magnesite, calc, 500 lb bbls ton	83.00	74.00	88.00	65.00	80.00
Magnesium Carb, tech, 70 lb bgs, wks ..... lb.	...	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks ..... ton	...	...	32.00	...	32.00
Metal Ingots, c-l ..... lb.	...	...	.27	...	...
Oxide, calc tech, heavy bbls, frt all'd ..... lb.	...	...	.26	...	.26
Light bbls above basis lb.	...	...	.26	...	.26
USP Heavy, bbls, above basis ..... lb.	...	...	.26	...	.26
Palmitate, bbls ..... lb.	.33	.33	.35	.33	.35
Silicofluoride, bbls .... lb.	.20	.20	.25	.11	.25
Stearate, bbls ..... lb.	.31	.31	.33	.23	.31
Manganese, acetate, drs .. lb.	...	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	.15	.16	.15	.16
Chloride, bbls ..... lb.	.14	nom.	nom.	...	.14
Dioxide, tech (peroxide), paper bgs, c-l ..... ton	...	...	70.00	...	71.50
Hydrate, bbls ..... lb.	...	...	.82	...	.82
Linoleate, liq. drs ..... lb.	.18	.18	.19½	.18	.19½
solid, precip, bbls .... lb.	...	...	.19	...	.19
Resinate, fused bbls ... lb.	.08¼	.08¼	.08½	.08¼	.08½
precip, drs ..... lb.	...	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs .... lb.	.10½	.10½	.11½	.10½	.11½
Mangrove, 55%, 400 lb bbls lb.					
Bark, African ..... ton	no prices		no prices	34.00	38.00
Mannitol, pure cryst, cs, wks lb.	...	.85	...	.85	.90
commercial grd, 250 lb bbls ..... lb.	...	.40	...	.40	.35	.45
Marble Flour, blk ..... ton	12.50	14.50	12.50	14.50	12.00	14.50
Mercury chloride (Calomel) lb.	...	2.95	...	2.95	2.70	2.95
Mercury metal ..76 lb. flasks	191.00	193.00	191.00	210.00	167.00	215.00
Mesityl Oxide, f.o.b. dest, tks ..... lb.	...	.10½	...	.10½	.10½	.15
drs, c-l ..... lb.	...	.12½	.11½	.12½	.11½	.16
drs, lcl ..... lb.	...	.13	.12	.13	.12	.16½
Meta-nitro-aniline ..... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ..... lb.	1.05	1.10	1.05	1.10	1.05	1.10
Meta-phenylene diamine 300 lb bbls ..... lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls ..... lb.	...	.70	...	.70	.65	.70
Methanol, denat, grd. drs, c-l frt all'd (*PC*) gal.	...	.66	...	.66	.60	.66
tks, frt all'd ..... gal.	...	.60	...	.60	...	.60
Pure, nat, drs, c-l, frt all'd ..... gal. *a*	.55½	.61½	.55½	.61½	.35½	.55½
tks, nat ..... gal. *a*	.50	.54½	.50	.54½	.30	.50
Synth, pure, drs .... gal. *b*	.34½	.40½	.34½	.40½	...	...
tks, synth ..... gal. *b*	.28	.32½	.28	.32½	...	...
Methyl Acetate, tech tks, delv ..... lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv ..... lb.	.11	.12½	.11	.12½	.07	.12½
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv ..... lb.	.10½	.13	.10½	.13	.10½	.13
Acetone, frt all'd, drs gal. *p*	...	.81	...	.81	.37½	.81
tks, frt all'd ..... gal. *p*	...	.75	...	.75	.32	.75
Synthetic, frt, all'd, drs ..... gal. *p*	.51	.54½	.51	.54½	.37½	.51
tks, frt all'd ...gal.	.43	.45½	.43	.45½	.32	.43
Anthraquinone ..... lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ..... lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb. lots, frt all'd ..... lb.	.50	.55	.50	.55	...	.55
less than 100 lbs. f.o.b. wks ..... lb.	...	.60	...	.60	...	.60
Chloride, 90 lb. cyl ... lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.08	...	.08	.06	.08
50 gal drs, frt all'd, c-l lb.	...	.09½	...	.09½	.07	.09½
Formate, drs, frt all'd .. lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd ... lb.	...	.70	...	.70	.70	.80
Mica, dry grd, bgs, wks ..ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs .... lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref., l-c-l, drs, f.o.b. wks ..... lb.	...	.16	...	.16	.16	.19
crude ..... lb.	...	.14	...	.14	.14	.15
Monoamylamine, c-l, drs, wks lb.	...	.61	.50	.61	.50	.52
lcl, drs, wks ..... lb.	...	.64	...	.64	...	.55
Monoamylnaphthalene, l-c-l, drs, f.o.b. wks ..... lb.	...	.17	...	.17	.17	.20
Monobutylamine, drs c-l, wks ..... lb.	...	.48	.40	.48	...	.40
l-c-l, wks ..... lb.	...	.51	.51	.64	...	.48
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks, lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks ..... lb.	...	.46	...	.46	.35	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs ..... lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks ..... lb.	...	.67	...	.67	...	.67

a Producers of natural methanol divided into two groups and prices vary for these two divisions; *b* Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones.

(*FP*) Full Priority. (*PC*) Price Control.



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Prices

Myrobalans
Para Toluidine

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Myrobalans 25%, liq bbls lb.	no prices	no prices		no prices	
50% Solid, 50 lb boxes lb.	no prices	no prices		no prices	
J1 bgs ton	no prices	no prices		35.00	48.00
J2 bgs ton	no prices	no prices		28.00	39.00
N					
Naphtha, v.m.&p. (deodorized) see petroleum solvents.					
Naphtha, Solvent, water-white, tks gal.	...	.27	...	.27	...	.26
drs, c-l gal.	...	.31	...	.31	...	.31
Naphthalene, dom, crude bgs. wks lb.	2.75	3.00	2.50	3.00	2.25	2.75
Balls, flakes, pks lb.	...	.08	...	.08	.06¼	.08
Balls, ref'd bbls, wks lb.	...	.08	...	.08	.07	.08
Flakes, re'd, bbls, wks lb.	...	.08	...	.08	.07	.08
Nickel Carbonate, bbls lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls lb.	.18	.20	.18	.20	.18	.20
Metal ingot lb.	.35	.36	.35	.36	.34	.36
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs lb.	...	.703	...	.703	...	.703
Nitre Cake, blk ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks lb.	.08	.09	.08	.09	.08	.09
tks lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		no prices	
dom, Eastern wks unit	...	3.50	2.75	3.50	2.20	3.00
dom, Western wks unit	...	3.35	2.60	3.35	1.75	2.60
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs lb.	no prices		no prices		.26	.29
O						
Oak Bark Extract, 25%, bbls lb.	.03½ nom.		.03½	.03¾	.03⅛	.03¾
tks lb.	.02 nom.		...	.02	.02¾	.03
Octyl Acetate, tks, wks lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY lb.	...	.12	...	.12	.11	.11½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks lb.	...	.25	...	.25	.15	.25
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks lb.	.17	.17½	.17	.17½	.16	.17½
Orthodichlorobenzene, 1000 lb drs lb.	.06	.07½	.06	.07½	.06	.07½
Orthonitrochlorobenzene, 1200 lb drs, wks lb.	.15	.18	.15	.18	.15	.18
Orthonitroparachlorphenol, tins lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.23	...	.23	.21	.23
51° liquid lb.	...	.10	...	.10	...	.10
P						
Paraffin, rfd, 200 lb bgs (*PC*) 122-127° M P lb.	...	.052	...	.052	.04¼	.057
128-132° M P lb.	.056	.0585	.056	.0585	.057	.0595
133-137° M P lb.	.0615	.0640	.0615	.0640	.06¼	.06½
Para aldehyde, 99%, tech, 55-110 gal drs, wks lb.	...	.12	...	.12	.10	.12
Aminoacetanilid, 100 lb kgs lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs lb.	...	.32	...	.32	...	.32
Dichlorobenzine 200 lb drs, wks lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks (*FP*) lb.	.23	.24	.23	.24	.23	.24
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks lb.	...	.45	...	.45	...	.45
Nitrochlorobenzene, 1200 lb drs, wks lb.	...	.15	...	.15	...	.15
Nitro-orthotoluidine, 300 lb bbls lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	...	.35
Nitrosodimethylaniline, 120 lb bbls lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Pentaerythritol, tech, bbls, delv lb.	.33½	.35½	.33½	.35½	...	...
Phenylenediamine, 350 lb bbls lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb. bbls lb.	...	.70	...	.70	...	.70
tks, wks lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks lb.	...	.48	...	.48	...	.48

(*FP*) Full Priority. (*PC*) Price Control

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Paris Green, dealers, drs lb.	.24	.26	.24	.26	.23	.25
Pentane, normal, 28-38° C, group, 3 tks (*PC*) ..gal.	...	.08½	...	.08½	...	.08½
drs, group 3 .....gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 10 lb drs, frt all'd (*FP*) .....lb.	.08	.08½	.08	.08½	.08	.08½
Petrolatum, dark amber, bbls .....lb.	...	.03¾	...	.03¾	.02¾	.03½
White, lily, bbls .....lb.	...	.05¾	...	.05¾	.04¾	.05¾
White, snow, bbls .....lb.	...	.06½	...	.06½	.05½	.06½
Petroleum Ether, 30-60°, group 3, tks .....gal.	...	.16	...	.16	.13½	.16
drs, group 3 .....gal.	...	.18	...	.18	.14½	.18

PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks, wks .....gal.	...	.07⅛	...	.07⅛	.07	.07⅛
East Coast, tks, wks gal.	...	.10½	...	.10½	.10	.10½
Lacquer diluents, tks East Coast .....gal.	...	.11	...	.11	.09½	.11
Group 3, tks .....gal.	.07⅛	.08⅛	.07⅛	.08⅛	.06¼	.08⅛
Naphtha, V.M.P., East tks, wks .....gal.	...	.10½	...	.10½	.09	.11
Group 3, tks, wks ...gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Petroleum thinner, 43-47, East, tks, wks .....gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks ...gal.	.06	.07	.06	.07	.05⅞	.07
Rubber Solvents, stand grd, East, tks, wks ..gal.	...	.10½	...	.10½	.09½	.10½
Group 3, tks, wks ...gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Stoddard Solvents, East, tks, wks .....gal.	...	.09½	...	.09½	.083	.09½
Group 3, wks .....gal.	...	.06⅝	...	.06⅝	.05½	.06⅝
Phenol, 250-100 lb drs ....lb.	.12½	.13	.12½	.13	.12	.13¾
tks, wks (*FP*) .....lb.	.11½	.12	.11½	.12	.11	.12
Phenyl-Alpha-Naphthylamine, 100 lb kgs .....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs .....lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com .....lb.	...	1.75	...	1.75	...	1.50
Phloroglucinol, tech, tins ..lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons .....lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines 70% basis .....ton	...	2.70	2.40	2.70	2.15	2.40
72% basis .....ton	...	3.20	3.00	3.20	2.50	3.00
Florida Pebble, 68% basis ton	...	2.20	2.00	2.20	1.90	2.00
75-74% basis .....ton	...	4.00	...	4.00	...	2.90
Tennessee, 72% basis ..ton	...	5.00	...	5.00	4.50	5.00
Phosphorus Oxychloride 175 lb. cyl (*FP*) .....lb.	.15	.18	.15	.18	.15	.18
Red, 110 lb cases .....lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs .lb.	.38	.42	.38	.42	.38	.42
Trichloride, cyl .....lb.	.15	.16	.15	.16	.15	.16
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb drs, wks .....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls Destructive dist .....lb.	...	.74	...	.74	.50	.65
Steam dist wat wh bbls gal.	...	1.10	...	1.10	.59	.68
Pitch Hardwood, wks ...ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks ....ton	19.00	22.00	19.00	22.00	19.00	22.00
Burgundy, dom, bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Imported .....lb.	no prices		no prices		no prices	
Petroleum, see Asphaltum in Gums' Section. Pine, bbls .....bbl.	6.75	7.00	6.75	7.00	6.00	7.00
Polyamylnaphthalene, l-c-l, drs, f.o.b. wks .....lb.	...	.25	...	.25	.25	.30
Potash, Caustic, wks, sol ..lb	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake .....lb.	...	.07	...	.07	...	.07
liquid, tks .....lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, Dom 30% basis, blk .....unit	...	.60	...	.60	...	.60

POTASSIUM

Potassium Abietate, bbls ..lb.	...	.08	...	.08	...	.08
Acetate, tech, bbls, delv lb.	...	.28	...	.28	.26	.28
Bicarbonate, USP, 320 lb bbls .....lb.	.19	.21	.14	.21	.14	.17
Bichromate Crystals, 725 lb csks *(*FP*) .....lb.	...	.09⅝	...	.09⅝	.08⅞	.09⅝
Binoxalate, 30 lb bbls ..lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks .....lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
liquid, tks .....lb.	...	.0275	...	.0275	...	.0275
drs, wks .....lb.	.03	.03⅛	.03	.03⅛	.03	.03⅛
Chlorate crys, 112 lb kgs, wks (*FP*) .....lb.	nom.	.11	nom.	.11	...	.11
gran, kgs .....lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs .....lb.	.09¾	.10	.09¾	.10	.09½	.10
Chloride, crys, bbls ....lb.	.08	nom.	.08	nom.	.04	.08
Chromate, kgs (*FP*) ...lb.	.24	.27	.24	.27	.24	.27
Cyanide, drs .....lb.	...	.55	...	.55	...	.55
Iodide, 250 lb bbls .....lb.	1.44	1.48	1.44	1.48	1.35	1.38
Metabisulfite, 300 lb bbls lb.	.18	.20	.18	.20	.18	.21
Muriate, bgs, dom, blk unit	.56	.58	.56	.58	.53½	.58
Oxalate, bbls .....lb.	.28	.30	.28	.30	.25	.30
Perchlorate, kgs, wks (*FP*) .....lb.	.09½	.11	.09½	.11	.09½	.11

* Spot price is ⅛c higher.
(*FP*) Full Priority. (*PC*) Price Control.

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Potassium Permanganate
Schaeffer's Salt

Prices

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Potassium (continued):					
Permanganate, USP, crys, 500 & 1000 lb drs, wks (*FP*) ....lb.	.20½ .21	.19¾	.21	.19¾	.21
Prussiate, red, bbls ....lb.	no prices	no prices		no prices	
Yellow, bbls ....lb.	.17 .19	.17	.19	.16	.19
Sulfate, 90% basis, bgs ton	... 36.25	...	36.25	...	36.25
Titanium Oxalate, 200 lb bbls ....lb.	... .45	...	.45	...	.40
Pot & Mag Sulfate, 48% basis bgs ....ton	... 26.00	...	26.00	26.00	27.00
Propane, group 3, tks (*PC*) lb.	... .03	...	.03	.03¾	.04
Putty, com'l, tubs ....100 lb.	... 3.15	...	3.15	...	3.15
Linseed Oil, kgs ....100 lb.	... 5.00	...	5.00	...	5.00
Pyrethrum, conc liq: 2.4% pyrethrins, drs, frt all'd ....gal.	... 5.75	4.30	5.75	4.40	4.95
3.6% pyrethrins, drs, frt all'd ....gal.	... 8.53	6.35	8.53	6.60	7.20
Flowers, coarse, bgs ....lb. bgs ....lb.	.27 .28	.21	.28	.20	.25
Fine powd, bbls ....lb.	.28 .29	.22	.29	.21	.26
Pyridine, denat, 50 gal drs gal.	... 1.71	...	1.71	...	1.71
Refined, drs ....lb.	... .46	...	.46	...	.48
Pyrites, Spanish cif Atlantic ports, blk ....unit	no prices	no prices		no prices	
Pyrocatechin, CP, drs, tins lb.	2.15 2.40	2.15	2.40	2.15	2.40
Q					
Quebracho, 35% liq tks ..lb.	... .05¼	...	.05¼	.03¾	.05½
450 lb bbls, c-l ....lb.	... .05	...	.05	.04¼	.05
Solid, 63%, 100 lb bales cif ....lb.	... .04⅞	...	.04⅞	...	.04⅞
Clarified, 64% bales ..lb.	... .05	...	.05	.05	.05⅛
Quercitron, 41 deg liq, 450 lb. bbls ....lb.	... .10	...	.10	.08½	.09½
Solid, drs ....lb.	... .18½	.18	.18½	.11	.16½
R					
R Salt, 250 lb bbls, wks ..lb.	... .55	...	.55	...	.55
Resorcinol, tech cans ....lb.	.68 .74	.68	.74	.68	.74
Rochelle Salt, cryst ....lb.	... .43½	...	.43½	.32½	.43½
Powd, bbls ....lb.	... .42½	...	.42½	.31½	.42½
Rosin Oil, bbls, first run gal.	... .51	.48	.51	.40	.50
Second run ....gal.	... .53	.50	.53	.42	.56
Third run, drs ....gal.	... .57	.54	.57	.46	.57
Rosins 600 lb bbls, 100 lb unit ex, yard NY:**					
B	... 2.96	2.96	3.66	2.06	3.55
D	... 2.73	2.73	3.65	2.08	3.55
E	... 3.06	3.06	3.74	2.07	3.62
F	... 3.27	3.27	3.79	2.08	3.59
G	... 3.52	3.52	3.79	2.18	3.52
H	... 3.53	3.53	3.79	2.27	3.50
I	... 3.53	3.53	3.79	2.26	3.50
K	... 3.56	3.56	3.88	2.36	3.61
M	... 3.70	3.70	3.94	2.38	3.68
N	... 3.70	3.70	4.05	2.47	3.71
WG	... 3.71	3.71	4.81	2.79	4.52
WW	... 3.75	3.75	5.20	3.05	4.57
X	... 3.75	3.75	5.20	3.10	4.57
Rosins, Gum, Savannah (280 lb. unit):**					
B	... 2.08	2.08	3.10	1.31	3.00
D	... 2.31	2.31	3.21	1.51	3.00
E	... 2.41	2.41	3.27	1.60	3.07
F	... 2.62	2.62	3.24	1.62	3.04
G	... 2.87	2.87	3.24	1.60	2.97
H	... 2.88	2.88	3.24	1.63	2.97
I	... 2.88	2.88	3.24	...	2.98
K	... 2.91	2.91	3.30	1.84	3.06
M	... 3.05	3.05	3.39	2.01	3.13
N	... 3.05	3.05	3.50	2.65	3.16
WG	... 3.06	3.06	4.26	2.76	3.97
WW	... 3.10	3.10	4.65	2.96	4.02
X	... 3.10	3.10	4.65	2.96	4.02
Rosin, Wood, c-l, FF grade, NY	1.70 2.00	1.70	2.00	1.40	2.00
Rotten Stone, bgs mines ton	25.50 37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls ..lb.	no prices	no prices		no prices	
Powdered, bbls ....lb.	no prices	no prices		no prices	
S					
Sago Flour, 150 lb bgs ..lb.	.05 .05¾	.04¾	.05¾	.03½	.05½
Sal Soda, bbls wks ...100 lb.	... 1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks ....ton	... 15.00	...	15.00	13.00	17.00
Chrome, c-l, wks ....ton	... 16.00	...	16.00	...	16.00
Saltpetre, gran, 450-500 lb bbls ....lb.	... .082	...	.082	.076	.082
Cryst, bbls ....lb.	... .092	...	.092	.086	.092
Powd, bbls ....lb.	... .092	...	.092	.086	.092
Satin, White, pulp, 550 lb bbls ....lb.	.01¼ .01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs ....lb.	... .46	...	.46	...	.46

** Jan. 30, 1941, high and low based on 280 lb. unit.

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y., refined 6c higher in each case; (*FP*) Full Priority. (*PC*) Price Ceiling.

Current

Shellac
Tungstate

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Shellac, Bone dry, bbls ..lb. *s*	.39	.40	.39	.40	.26	.40
Garnet, bgs .....lb.	.37	.39	.37	.39	.20	.39
Superfine, bgs .....lb. *s*	.32	.33	.32	.34	.16½	.34
T. N., bgs .....lb. *s*	.31	.32	.31	.33	.16	.33
Silver Nitrate, vials .....oz.	...	.26⅞	...	.26⅞	.24	.26⅞
Slate Flour, bgs, wks ....ton	11.00	12.00	9.00	12.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	...	1.15	...	1.15	...	1.15
58% light, bgs ....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
blk .....100 lb.	...	.90	...	.90	...	.90
paper bgs .....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls .....100 lb.	...	1.35	...	1.35	1.35	1.45
Caustic, 76% grnd & flake, drs .....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs .....100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks ..100 lb.	...	2.00	...	2.00	...	2.00
SODIUM						
Sodium Abietate, drs .....lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks .....lb.	...	.05	...	.05	.04	.06
90%, bbls 275 lb delv lb.	.06½	.07	.06½	.07	.06	.07
anhyd, drs, delv .....lb.	.08½	.10	.08½	.10	.08¼	.10
Alginate, drs .....lb.	.69	.73	.69	.73	.39	.73
Antimoniate, bbls .....lb.	.15	.15½	.15	.15½	.14	.15½
Arsenate, drs .....lb.	...	.08	...	.08	.07	.08¾
Arsenite, liq, drs .....gal.	...	.35	...	.35	...	.35
Dry, gray, drs, wks ..lb.	...	.06¾	...	.06¾	.06½	.09¼
Benzoate, USP kgs ....lb.	.46	.50	.46	.50	.46	.50
Bicarb, powd, 400 lb bbl, wks .....100 lb.	...	1.70	...	1.70	...	1.70
Bichromate, 500 lb cks, wks* (*FP*) .....lb.	...	.07⅞	...	.07⅞	.06⅞	.07½
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	1.40	1.80
Chlorate, bgs, wks .....lb.	...	.06¼	...	.06¼	...	.06¼
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv .....lb.	.09½	.10½	.09½	.10½	.09	.10
Fluoride, white 90%, 300 lb bbls, wks .....lb.	...	.08	...	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.17	.18	.17	.18	.17	.18
Hyposulfite, tech, pea crys 375 lb bbls, wks ..100 lb.	...	2.75	...	2.75	...	2.80
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	...	2.45	...	2.45	...	2.45
Iodide, Jars .....lb.	...	2.42	...	2.42	...	2.42
Metanilate, 150 lb bbls ..lb.	...	.40	...	.40	.41	nom.
Metasilicate, gran, c-l, wks .....100 lb.	...	2.50	...	2.50	2.35	2.50
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	...	3.05
Anhydrous, wks, c-l, drs .....100 lb.	...	4.00	...	4.00	3.75	4.00
wks, lcl, drs ...100 lb.	...	5.05	...	5.05	5.05	5.05
Monohydrated, bbls ....lb.	...	.026	...	.026	.023	.026
Naphthenate, drs .....lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	...	.50
Nitrate, 92% crude, 200 lb. bgs, c-l, NY .....ton	...	29.35	...	29.35	28.70	29.35
100 bgs, same basis ..ton	...	30.05	...	30.05	29.40	30.05
Bulk .....ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ....lb.	...	.06¾	...	.06¾	.06¾	.11½
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l anhyd. .....lb.	...	.04¾	...	.04¾	.04½	.04¾
hyd, flake, 300 lb bbls, c-l, f.o.b. wks .....lb.	.03	...	...	...	.0285	.03
Perborate, drs, 400 lb ..lb.	...	.14¾	...	.14¾	.14¾	.15¼
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	2.75	2.90	2.75	2.90	2.30	2.90
bgs, wks .....100 lb.	2.55	2.70	2.55	2.70	2.10	2.70
Tri-sodium, tech, 325 lb. bbls, wks .....100 lb.	2.90	3.05	2.90	3.05	2.45	3.05
bgs, wks .....100 lb.	2.70	2.85	2.70	2.85	2.25	2.85
Picramate, 160 lb kgs ..lb.	...	.65	...	.65	...	.65
Prussiate, Yellow, 350 lb bbls, wks .....lb.	...	.11	...	.11	.10½	.11
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	.0545	.0638	.0545	.0638	.0510	.0610
Sesquisilicate, drs, c-l, wks .....100 lb.	...	3.05	...	3.05	...	3.05
Silicate, 60°, 55 gal drs, wks .....100 lb.	...	1.70	...	1.70	...	1.70
40°, 55 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks .....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY .....lb.	.12	.15	.12	.15	.09¾	.15
Stannate, 100 lb drs ....lb.	.33½	.36½	.33½	.36½	.32½	.37
Stearate, bbls .....lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks .....100 lb. *s*	1.70	1.90	1.70	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb bbls, c-l, wks .....lb.	...	.024	...	.024	.02¼	.03
Solid, 650 lb drs, c-l, wks .....lb.	...	.0315	...	.0315	.03	.03¼
Sulfite, powd, 400 lb bbls wks .....lb.	...	.05¼	...	.05¼	...	.05¼
Sulfocyanide, drs .....lb.	.55	.65	.55	.65	.28	.65
Sulforicinoleate, bbls ...lb.	...	.12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)						
Tungstate, tech, crys, kgs lb.	no prices		no prices		no prices	

s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. *t* Bags 15c lower; * Feb. 28. (*PC*) Price Control.

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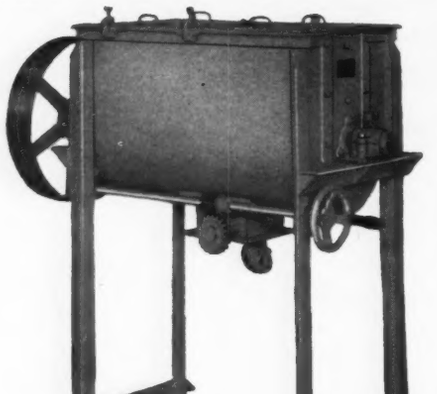

1 to 5½ cubic feet capacities

This mixer fills the need for a small-capacity mixer where varying mixing formulae require frequent, thorough cleaning to prevent contamination. Slotted ends, carrying the bearings, shaft and mixing element permit quick removal, making all parts readily accessible for thorough cleaning.

In addition we manufacture Grinding, Sifting, Mixing and Handling Equipment for the processing industries. Write us regarding your requirements.

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Sorbitol
Tributyl Citrate

Prices

		Current Market		1942 Low	1942 High	1941 Low	1941 High
Sorbitol, drs, wks	lb.	...	.17¾	...	.17¾	.14¾	.17¾
Spruce, Extract, ord, tks	lb.	...	.01½	.01¼	.01½	.01⅜	.01¼
Ordinary, bbls	lb.	...	.02⅛	.01¾	.02⅛	.01⅜	.01¾
Super spruce ext, tks	lb.	...	.01½	...	.01½	.01⅜	.01½
Super spruce ext, bbls	lb.	...	.02	...	.02	.01⅞	.02
Super spruce ext, powd, bgs	lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs	100 lb.	...	3.10	...	3.10	2.90	3.10
Powd, 140 lb bgs	100 lb.	...	3.20	...	3.20	3.05	3.80
Potato, 200 lb bgs	lb.	...	.0610	...	.0610	.04½	.0585
Imp, bgs	lb.	no prices		no prices		no prices	
Rice, 200 lb bbls	lb.	.09	.10	.09	.10	.07½	.09½
Sweet Potato, 240 lb bbls, f.o.b. plant	100 lb.	nom.	7.00	nom.	7.00	nom.	7.00
Wheat, thick, bgs	lb.	...	.05	...	.05	...	.05
Strontium, carbonate, 600 lb bbls, wks	lb.	no prices		no prices		no prices	
Nitrate, 600 lb bbls, NY	lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
Sucrose, octa-acetate, den, grd, bbls, wks	lb.	...	.45	...	.45	...	.45
tech, bbls, wks	lb.	...	.40	...	.40	...	.40

SULFUR

Sulfur, crude, f.o.b. mines	ton	...	16.00	...	16.00	...	16.00
Flour, com'l, bgs	100 lb.	1.65	1.95	1.65	1.95	1.40	1.95
bbls	100 lb.	1.95	2.50	1.95	2.50	1.95	2.50
Rubbermakers, bgs	100 lb.	...	2.05	...	2.05	...	2.05
bbls	100 lb.	...	2.35	...	2.35	...	2.35
Extra fine, bgs	100 lb.	...	2.35	...	2.35	...	2.35
Superfine, bgs	100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls	100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs	100 lb.	3.05	3.35	3.05	3.35	2.80	3.35
bbls	100 lb.	3.40	3.70	3.40	3.70	3.15	3.70
Roll, bgs	100 lb.	2.40	2.70	2.40	2.70	2.15	2.70
bbls	100 lb.	2.30	2.85	2.30	2.85	2.30	2.85
Sulfur Chloride, 700 lb drs, wks	lb.	.03	.08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl	lb.	.07	.09	.07	.09	.07	.09
Multiple units, wks	lb.	.04½	.07	.04½	.07	.04½	.07
tks, wks	lb.	.04	.06	.04	.06	.04	.06
Refrigeration, cyl, wks	lb.	.16	.40	.16	.40	.16	.40
Multiple units, wks	lb.	.07½	.10	.07½	.10	.07½	.10
Sulfuryl Chloride	lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd	ton	no prices		no prices		no prices	
Extract, 42°, bbls	lb.	.08	.06¼	.08	.06¼	.06	.08
Superphosphate, 16% bulk, wks	ton	10.10	10.80	10.10	10.80	8.50	10.00
Run of pile	ton	9.60	10.20	9.60	10.20	8.00	9.60
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit	ton	...	.85	.80	.85	.68	.80

T

Talc, Crude, 100 lb bgs, NY	ton	14.50	24.50	14.00	24.50	14.00	16.00
Ref'd 100 lb bgs, NY	ton	17.25	19.25	17.25	19.25	17.25	19.25
French, 220 lb bgs, NY	ton	no prices		no prices		no prices	
Ref'd, white bgs, NY	ton	no prices		no prices		no prices	
Italian, 220 lb bgs to arr	ton	no prices		no prices		no prices	
Ref'd, white bgs, NY	ton	no prices		no prices		no prices	
Tankage, Grd, NY	unit u	...	4.85	4.25	4.85	2.35	4.10
Ungrd	unit u	...	5.35	5.25	5.70	2.35	5.10
Fert grade, f.o.b. Chgo	unit u	...	5.60	5.60	5.90	2.35	5.60
South American cif	unit u	...	5.35	5.05	5.60	2.60	4.75
Tapioca Flour, high grade, bgs	lb.	.04	.07	.04½	.07	.03	.06¾
Tar Acid Oil, 15%, drs	gal.	...	.27½	...	.27½	.22	.24
25% drs	gal.	...	.31½	...	.31½	.25	.27½
Tar, pine, delv, drs	gal.	...	.33	.32½	.33	.26	.29
tks, delv, E. cities	gal.	...	.24	...	.24	...	.22
Tartar Emetic, tech, bbls	lb.	...	.47¾	...	.47¾	.36¾	.47¾
USP, bbls	lb.	.52¾	.53	.52¾	.53	.42	.53
Terpineol, den grade, drs	lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs	lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech	lb.	.08	.09	.08	.09	.08	.09
Tetralene, 50 gal drs, wks	lb.	...	.19	...	.19	.19	.21
Thiocarbanilid, 170 lb bbls	lb.	...	.24	...	.24	...	.24
Tin, crystals 500 lb bbls, wks	lb.	.39	.39½	.39	.39½	.38	.40
Metal, NY (*PC*)	lb.	...	.52	...	.52	.501	.52¾
Oxide, bbls, wks	lb.	.55	.57	.55	.57	.54	.56
Tetrachloride, 100 lb drs, wks	lb.	no prices		no prices		.25¼	.31
Titanium Dioxide, 300 lb bbls	lb.	...	.14½	...	.14½	.13¾	.14½
Barium Pigment, bbls	lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Calcium Pigment, bbls	lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
Titanium tetrachloride, drs, f.o.b. Niagara Falls	lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls	lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls	lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks	lb.	...	.26	...	.26	...	.26
Toluol, drs, wks (*FP*)	gal.	...	.33	...	.33	.32	.33
tks, frt all'd (*FP*)	gal.	...	.28	...	.28	.27	.28
Toner Lithol, red, bbls	lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls	lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs	lb.	...	1.05	...	1.05	...	1.05
Triacetin, 50 gal drs, wks,	lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks,	lb.	...	.33	...	.33	.27	.33
Triamylamine, drs, lcl, wks, drs	lb.	...	1.01	...	1.01	...	1.01
Tributylamine, lcl, drs, f.o.b. wks	lb.	...	.81	...	.81	...	.81
Tributyl citrate, drs, frt all'd	lb.	...	.24	...	.24	.24	.26

(*FP*) Full Priority.

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Tributyl Phosphate, frt all'd	lb.	...	.47	...	.47	.42	.47
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts	lb.	(*FP*) .08	...	.08	.08	.09
Tricresyl phosphate, tech, (*FP*)	lb.	.25	.31	.25	.31	.22	.36½
Triethanolamine, 50 gal drs, wks	lb.	...	.19	...	.19	...	.19
tks, wks	lb.	...	.18	...	.18	...	.18
Triethylamine, lcl, drs, f.o.b. wks	lb.	..	1.16	...	1.16	...	1.16
Triethylene glycol, drs, wks	lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls	lb.	...	.30	...	.30	...	.30
Stearate bbls	lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest.	lb.	.54	.56	.54	.56	.50	.54
Trimethylamine, c-l, drs, frt all'd E. Mississippi	lb.	..	.85	...	.85	.85	1.00
Triphenylguanidine	lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs (*FP*)	lb.	.31	.32	.31	.32	.33	.38
Tripoli, airfloated, bgs, wks	ton	21.00	26.00	21.00	26.00	21.00	26.00
Turpentine (Spirits), c-l, NY dock, bbls	gal.	...	.69¼	.69¼	.82½	.45	.83
Savannah, bbls	gal.	...	.55¼	.55¼	.70½	.33½	.72½
Wood Steam dist, drs, c-lcl, NY	gal.	...	.61	.61	.80	.35	.76
tks, delv E. cities	gal.	...	.56	.56	.72	...	...
Wood, dest dist, cl-lcl, drs, delv E. cities	gal.	.60	.65	.60	.70	.35	.65
tks, delv E. cities	gal.	...	.55	.55	.58	...	...
U							
Urea, pure 112 lb cases	lb.	...	.12	...	.12	...	.12
Fert grade, bgs, c. i. f. S.A. points	ton	no prices		no prices		no prices	
Dom f.o.b., wks	ton	...	80.00	...	80.00	...	85.00
Urea Ammonia, liq., nitrogen basis	ton	...	121.58	...	121.58	...	121.58
V							
Valonia beard, 42%, tannin bgs	ton	no prices		no prices		no prices	
Cups, 32% tannin bgs	ton	no prices		no prices		no prices	
Extract, powd, 63%	lb.	no prices		no prices		no prices	
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots	lb.	...	2.60	...	2.60	...	2.60
Ex-guaiacol	lb.	...	2.35	..	2.35	2.50	2.55
Ex-lignin	lb.	...	2.35	...	2.35	2.50	2.55
Vermilion, English, kgs	lb.	3.12	3.17	3.12	3.17	3.12	3.17
W							
Wattle Bark, bgs	ton	41.00	43.00	41.00	43.00	37.50	43.00
Extract, 60°, tks, bbls	lb.	.046	.0475	.046	.0475	.03⅞	.05
Wax, Bayberry, bgs	lb.	.18	.20	.18	.20	.18	.20
Bees, bleached, white 500 lb slabs, cases	lb.	...	.61	.58	.61	.36½	.56
Yellow, African, bgs	lb.	...	.49	...	.49	.30	.47
Brazilian, bgs	lb.	...	.50	...	.50	.31	.50
Refined, 500 lb slabs, cases	lb.	.59	.60	.55	.60	.35	.52
Candelilla, bgs	lb.	...	.38	.33	.38	.19	.33
Carnauba, No. 1, yellow, bgs	lb.	.88	.89	.87	.89	.68	.88
No. 2, yellow, bgs	lb.	.87	.88	.86	.88	.66	.85
No. 2, N. C., bgs	lb.	.84	.85	.82	.85	.62	.79
No. 3, Chalky, bgs	lb.	.77	.78	.75	.78	.55	.78
No. 3, N. C., bgs	lb.	.78	.79	.77	.79	.58	.79
Ceresin, dom, bgs	lb.	.13½	.14	.13½	.14	.11	.14
Japan, 224 lb cases	lb.	.40	.45	.30	.45	.16½	.35
Montan, crude, bgs	lb.	.45	.46	.45	.46	.45	.46
Paraffin, see Paraffin Wax.							
Spermaceti, blocks, cases	lb.	.26	.27	.24	.27	.24	.25
Cakes, cases	lb.	.27	.28	.25	.28	.25	.26
Wood Flour, c-l, bgs	ton						
bgs, c-l, wks	ton	24.00	25.00	24.00	25.00	24.00	25.00
Whiting, chalk, com 200 lb		18.00	22.00	18.00	22.00	18.00	19.00
Gilders, bgs, c-l, wks	ton	20.00	24.00	16.00	24.00	16.00	20.00
X							
Xylol, frt all'd, East 10° tks, wks	gal.	...	.27	...	.27	...	.29
Com'l tks, wks, frt all'd	gal.	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs	lb.	.35	.36	.35	.36	.35	.36
Z							
Zein, bgs, 1000 lb lots, wks	lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv	lb.	.16	.17	.16	.17	.15	.16
Arsenite, bgs, frt all'd	lb.	...	.12	...	.12	...	.12
Carbonate tech, bbls, NY	lb.	.14	.20	.14	.20	.14	.20
Chloride fused, 600 lb drs, wks	lb.	...	.05	...	.05	...	.05
Gran, 500 lb drs, wks	lb.	...	.0575	...	.0575	...	.0575
Soln 50%, tks, wks 100 lb.		...	2.50	...	2.50	2.25	2.50

(*FP*) Full Priority. (*PC*) Price Control.

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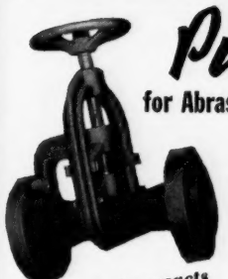

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Chemicals for the Nation's War Effort

A-3

Zinc Cyanide
Whale Oil

Prices Current

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Zinc (continued)						
Cyanide, 100 lb drs ....lb.	.33	.37	.33	.37	.33	.37
Dust, 500 lb bbls, c-l, delv lb.	...	.1035	...	.1035	.09¼	.1035
Metal, high grade slabs, c-l, NY (*FP*) (*PC*) 1000 lb.	...	8.65	...	8.65	7.65	8.64
E. St. Louis .....100 lb.	...	8.25	...	8.25	7.25	8.25
Oxide, Amer, bgs, wks lb.	...	.07¼	...	.07¼	.06½	.07½
French 300 lb bbls, wks lb.	...	.07¼	...	.07¾	.06¾	.07¼
Palmitate, bbls .....lb.	.32	.33	.32	.33	.24½	.33
Resinate, fused, pale bbls lb.	.11	.12	.10	.12	...	.10
Stearate, 50 lb bbls ....lb.	.30	.31	.30	.31	.22	.31
Sulfate, crys, 40 lb bbls wks .....lb.	...	.360	.360	.365	.315	.365
Flake, bbls .....lb.	...	.410	.405	.410	.335	.405
Sulfide, 500 lb bbls, delv lb.	...	.08½	.08	.08½	...	.08
bgs, delv .....lb.	.14	.14¼	.14	.14¼	.08	.13¼
Sulfocarbolate, 100 lb kgs lb.	.24	.29	.24	.29	.03½	.07¾
Zirconium Oxide, crude, 70-75% grd, bbls, wks ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

Babassu, tks, futures .....lb.	no prices		no prices		...	.06
Castor, No. 3, 400 lb drs lb.	...	.13¾	.12½	.13¾	.0180	.12½
(*PC*) Blown, 400 lb drs lb.	...	.15¼	.14	.15¼	.11¾	.14
China Wood, drs, spot NY lb.	.40½ nom.		.40½ nom.		.27¼	.37¼
Tks, spot NY .....lb.	.38¾ nom.		.38¾ nom.		.26¼	.35½
Coconut, edible, drs NY ..lb.	no prices		no prices		.08	.15½
Manila, tks, NY .....lb.	no prices		no prices		.03½	.10
Tks, Pacific Coast ....lb.	no prices		no prices		....	.03¼
Cod, Newfoundland, 50 gal bbls .....gal.	...	.90	.85	.90	.07½	.80
Copra, bgs, NY .....lb.	no prices		no prices		.0180	.04¼
Corn, crude, tks, mills ...lb.	.12¾ nom.		.12½	.12¾	.06⅝	.13
Refd, 375 lb bbls, NY ..lb.	.15 nom.		.15	.15½	.14¾	.16
Degras, American, 50 gal bbls, NY .....lb.	.12½ nom.		.11½	.12½	.07½	.08¾
Greases, Yellow .....lb.	...	.0929	...	.0929	.04¾	.08½
White, choice, bbls, NY lb.	...	.097	...	.097	.05	.09
Lard, Oil, Edible, prime ..lb.	...	.15½	...	.15½	.08½	.14½
Extra, bbls .....lb.	...	.15¼	.15	.15¼	.08¼	.13¾
Extra, No. 1, bbls .....lb.	...	.14⅝	.14½	.14⅝	.08	.13¼
Linseed, Raw less than 5 drs lots .....lb.	...	.149	.125	.149	.091	.123
drs, c-l, spot .....lb.	.141	.143	.117	.143	.095	.190
Tks .....lb.	.132	.134	.108	.134	.084	.1060
Menhaden, tks, Baltimore gal.	nom.	.666	.63¾	.666	.30	.60
Refined, alkali, drs ....lb.	.124	.1280	.12	.1280	.084	.122
Kettle boiled, drs .....lb.	.134	.1380	.13	.1380	.096	.132
Light pressed, drs .....lb.	.1140	.1180	.11	.1180	.082	.112
Tks .....lb.	.106	.108	.102	.108	.072	.10
Neatsfoot, CT, 20°, bbls, NY lb.	nom.	.25¾	...	.25¾	.18¼	.26½
Extra, bbls, NY .....lb.	nom.	.14½	...	.14½	.08¼	.14
Pure, bbls, NY .....lb.	nom.	.17¾	...	.17¾	.12¼	.17¾
Oiticica, bbls .....lb.	.25¼ nom.		.25¼ nom.		16½	.23½
Oleo, No. 1, bbls, NY ...lb.	...	.13¼	...	.13¼	.07⅜	.13¼
No. 2, bbls, NY .....lb.	...	.13	...	.13	.07⅜	.13
Olive, denat, bbls, NY ..gal.	4.20	4.30	4.00	4.50	2.25	4.25
Edible, bbls, NY .....gal.	5.00	5.50	5.00	5.50	4.75	5.30
Foots, bbls, NY .....lb.	.19½ nom.		.19	.20	.10¼	.19
Palm, Kernel, bulk .....lb.	no prices		no prices		no prices	
Niger, cks .....lb.	.09¼ nom.		.09¼ nom.		.04¼	.09
Sumatra, tks .....lb.	no prices		no prices		.02	.09
Peanut, tks, f.o.b. mill ...lb.	.13	nom.	.13	nom.	.05¼	.16
Refined, bbls, NY .....lb.	.17	nom.	.16¾	.17	.08	.16
Perilla, drs, NY .....lb.	...	.246	...	.246	.18	.23
Tks, Coast .....lb.	...	.2380	...	.2380	.16½	.21½
Pine, see Pine Oil, Chem. Sec.						
Rapeseed, blown, bbls, NY lb.	.18	.18½	.18	.18½	.16½	.18
Denatured, drs, NY ..gal.	...	nom.	...	nom.	.95	1.00
Red, Distilled, drs .....lb.	.133	.143	.12¾	.143	.07¼	.13
Tks .....lb.	...	.1245	.12	.12½	.06¼	.11½
Sardine, Pac Coast, tks ..gal.	.66½ nom.		.66½ nom.		.39	.62½
Refined alkali, drs .....lb.	.124	.128	.12	.128	...	...
Light pressed, drs .....lb.	.114	.118	.11	.118	.084	.122
Tks .....lb.	.106	.108	.102	.108	.078	.112
Soy Bean, crude						
Dom, tks, f.o.b. mills ..lb.	.12¼ nom.		.12¼ nom.		.05½	.12¾
Crude, drs, NY .....lb.	.13 nom.		.13 nom.		.06¼	.12½
Ref'd, drs, NY .....lb.	.14¾ nom.		.14½ nom.		.05½	.12¾
Tks .....lb.	.13½ nom.		.13½ nom.		.07⅛	.13½
Sperm, 38° CT, bleached (*FP*) bbls, NY .....lb.	.1301	...	.1301	nom.	.11	.127
45° CT, blchd, bbls, NY lb.	.1278	...	.1278	nom.	.103	.12
Stearic Acid, double pressed dist bgs .....lb.	.15	.16½	.15	.16½	.09½	.13¾
Double pressed saponified bgs .....lb.	.15¼	.16¾	.15¼	.16¾	.09¾	.14
Triple pressed dist bgs lb.	.18	.19½	.18	.19½	.12½	.16½
Stearine, Oleo, bbls .....lb.	...	.11	...	.11	...	.09
Tall, crude, drs, c-l, wks ton	...	55.00	40.00	55.00	...	...
tks, wks .....ton	...	40.00	30.00	40.00	...	...
dist, drs, c-l, delv .....lb.	...	.05	.04	.05	...	...
tks, wks .....lb.	...	.04½	.03½	.04½	...	...
Tallow City, extra loose ..lb.	...	.097¼	...	.097¼	...	.07⅜
Edible, tierces .....lb.	no prices		no prices		...	.05⅛
Acidless, tks, NY .....lb.	.13	nom.	.13	nom.	.07½	.11½
Turkey Red, single, drs ..lb.	...	.08¾	...	.08¾	.06½	.08¼
Double bbls .....lb.	...	.12	...	.12	.09½	.11
Whale:						
Winter bleach, bbls, NY lb.	...	.1110	...	.1110	.099	.1110
Refined, nat, bbls NY ..lb.	...	.1070	...	.1070	.095	.1070

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A388. Negative Temperature Coefficient Resistance Material. 4-Page folder describes new material developed to compensate for resistance changes due to temperature variations, to reduce or eliminate initial current surge in electrical equipment, to provide various degrees of time delay in electrical units, and for use as a remote unit for temperature measurement, etc. Keystone Carbon Co., Inc.

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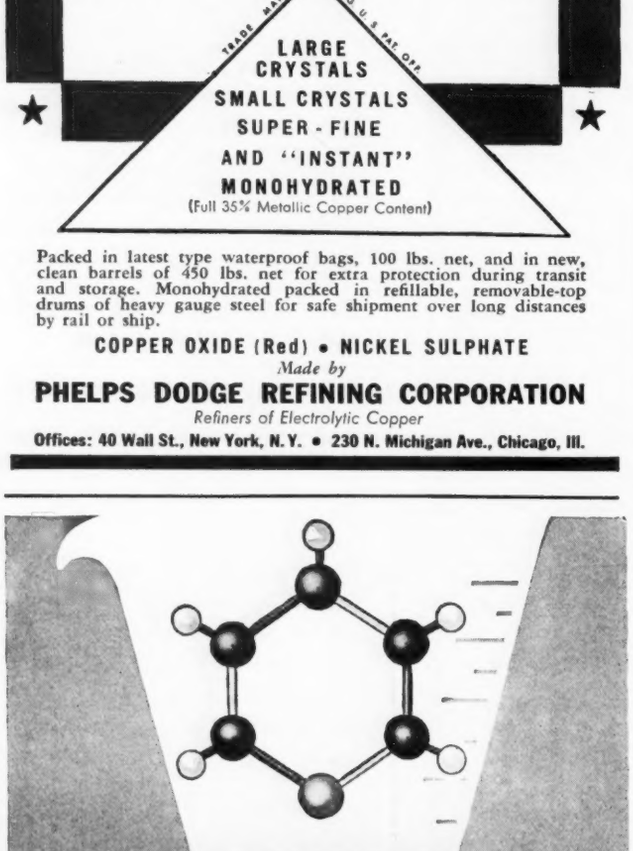

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Index to Advertisers

Albert & Son, L. 85
American British Chemical Supplies, Inc. 83
American Cyanamid & Chemical Corp. .....728 and 729
American Potash & Chemical Corp. 841

Badger & Co., E. B. 810
Baker Chemical Co., J. T. 817
Barrett Division, The Allied Chemical & Dye Corp. 737
Beacon Co., The 841
Bemis Bro. Bag Co. 732
Berk & Company, F. W. 841
Bower Chemical Mfg. Co., Henry 846
Brill Equipment Corp. 855
Burke, Edw. S. 851

Carbide & Carbon Chemicals Corp. 745
Church & Dwight, Inc. 833
Claflin, Alan 854
Commercial Solvents Corp. .....Cover 1
Consolidated Products Co., Inc. 855
Corning Glass Works 751
C. P. Chemical Solvents, Inc. 854
Crown Can Company 802

Darco Corp. 823
Diamond Alkali Co. 786
Doe & Ingalls, Inc. 854
Dow Chemical Co. 733
Dunkel & Co., Inc., Paul 842
du Pont de Nemours & Co., Inc., E. I., Electrochemicals Department 739
du Pont de Nemours & Co., Inc., E. I., Grasselli Chemicals Dept. 749

Eastern Steel Barrel Corp. 841
Eastman Kodak Co. 837
Electrochemicals Department, du Pont de Nemours & Co., Inc., E. I. 739
Emery Industries 735

Fairmount Chemical Co. 854
Fergusson Co., Alex C. 854
Foote Mineral Co., ... 839
Franks Chemical Products Co. 849
Freeport Sulphur Co. 833
Fulton Bag and Cotton Mills 839

General Chemical Co. .....Cover 3
Glyco Products Company, Inc. 825
Golwynne Chemicals Corporation 843
Grasselli Chemicals Dept., du Pont de Nemours & Co., Inc., E. I. 749
Gray & Co., William S. 839
Greeff & Co., R. W. 831
Gruendler Crusher and Pulverizer Co. 833

Harshaw Chemical Co., The 734
Heekin Can Company 743
Hercules Powder Co. 753
Heyden Chemical Corp. 791
Hooker Electrochemical Co. 741

Industrial Chemical Sales, Division West Virginia Pulp & Paper Co. 783
Innis, Speiden & Co. 793

Jefferson Lake Sulphur Co., Inc. 849
Johnson & Son, Inc., S. C. 851
Jones & Laughlin Steel Corp. 856

Kessler Chemical Corp. 827
King & Co., Inc., E. & F. 854
Knight, Maurice A. 831

La Pine & Company, Arthur S. 854
Loeb Equipment & Supply Co. 855

Index to Advertisers

Machinery & Equipment Corp. 855
Mallinckrodt Chemical Works 818
Mann & Co., Inc., Geo. 854
Marine Magnesium Products Corp. 850
Mathieson Alkali Works, Inc. 725
Merck & Co. 742
Meyer Drug Co., Inc., Herman 854
Michigan Alkali Co. 747
Mine & Smelting Supply Co., The 851
Molnar Laboratories 853
Monsanto Chemical Co. 779
Morgan & Co., Clarence 854
Morningstar Nicol, Inc. 821
Mutual Chemical Co. of America, Inc. 727

National Aniline Division, Allied Chemical & Dye Corp. .. 738
Natural Products Refining Co. 754
Neuberg Company, William D. ..... 841 and 855
Neville Company, The 852
Niacet Chemical Corp. 844
Niagara Alkali Company .....Insert facing page 730

Oldbury Electro-Chemical Co. 844

Pacific Coast Borax Co. 845
Packwood Mfg. Co., G. H. 855
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Philipp Brothers, Inc. 846
Pittsburgh Plate Glass Company, Columbia Chemical Division 750
Polachek, Z. H. 854
Prior Chemical Corp. 812

Reilly Tar & Chemical Corp. 752
Robinson Mfg. Co. 850
Rosenthal Co., H. H. 847

Schuylkill Chemical Co. 847
Sharples Chemicals, Inc., (formerly the Sharples Solvents Corp.) 815
Sherwood Refining Co., Inc. 848
Singer, T. E. R. 853
Snell, Inc., Foster D. 853
Solvay Sales Corp. .....Cover 2
South Florida Test Service 853
Sparkler Manufacturing Co. 848
Standard Alcohol Company 849
Starkweather Co., J. U. 854
Stauffer Chemical Co. 748
Stroock & Wittenberg Corp. 731

Tennessee Corp. 852
Texas Gulf Sulphur Co. 847
Tidewater Oil & Machinery Corp. 855
Turner & Co., Joseph 837

Union Carbide & Carbon Corp. 745
U. S. Industrial Chemicals, Inc., Insert facing pages 834 and 835
U. S. Potash Company 833
U. S. Stoneware Corp. 757

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Warner Chemical Co., Westvaco Chlorine Products Corp. 723
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Wishnick-Tumpeer, Inc. .....Cover 4

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We welcome to the advertising staff of CHEMICAL INDUSTRIES William "Bill" Hannum, formerly advertising manager of American Flange & Manufacturing. We are certain that his host of friends in the chemical and equipment fields will be delighted to know of his new connection and to wish him lots of luck.

Our congratulations to U.S.I. Chemical News (advertising insert of that company) on its tenth anniversary. For several years it was known as Solvent News.

John Q. Public is soon to know what all-out war really means. Release from the WPB states that manufacturers of bed sheets have been requested to cease manufacturing and selling colored sheets, colored sheeting and sheets with colored edges by July 1, all in the interest of a further saving on dyes. What more proof would any reasonable man want that the dyestuff manufacturers of this country have been taking orders from Hitler? And just think what this will do to the morale of the home front? Yes, we said morale, not morals!

Priorities
Allocations
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. Invaluable to you in your work.

Did you know that:—

The national income is near 109 billions?

President Roosevelt realizing that we face a critical shortage of technically trained men including chemists and engineers has requested Congress to appropriate $13,095,000 for Federal loans to needy students in these fields?

The soap industry is backing a salvage campaign for the conservation of grease for war production of glycerine? It is estimated that 15 million pounds can be salvaged from households in one year. Let's all grease the skids for the maniacal paperhanger.

That war production conference, sponsored by the united engineering societies, and held in Newark on Decoration Day eve, was bad news for Schickelgruber. Imagine in normal times getting more than a "Corporal's Guard" of executives, engineers and production men out for a conference lasting from three in the afternoon to eleven at night on the day previous to a holiday? It was an inspiring sight, indeed, to see over 900 such men eager to learn the ways and means of increasing our billets doux to Herr Hitler!

There will be no "summer dullness" this year either in the chemical marts nor in the editorial pages of "C. I." Scheduled for early issues are a number of outstanding features, including: "What About Glass in Process Equipment," by John T. Thompson of Corning Glass; "What About Plastics In Process Equipment," by Robert J. Moore of Bakelite; "DuPont—140 Years of Technical Progress," by William S. Dutton, who by the way is the author of the new book of somewhat similar title called "DuPont—140 Years." Also "What Are the Universities and Colleges Doing To Train Technologists In the Emergency," by Raymond E. Kirk of Brooklyn "Poly," and "The Story of Johnson's Wax" made famous by Mollie and Fibber McGee.

If you have not already marked your questionnaire for the 18th Chemical Industries' Buyer's Guidebook Number, do so NOW. Time is getting short and you may not make it if you delay further.

Fifteen Years Ago

From the Pages of Chemical Industries, June, 1927

Henry Howard of Grasselli Chemical, heads Manufacturing Chemists' Association.

Ralph E. Dorland, Dow, wins first prize at golf tournament of S. O. C. M. A., at Bellport, L. I.

Dr. John E. Teeple accepts bid to act as toastmaster at Fifth Annual Chemical Industries Dinner.

Warren N. Watson (now MCA secretary) is appointed chief of the Chemical Division of the U. S. Tariff Commission.

The new National Institute of Chemistry, sponsored by the American Chemical Society, plans symposium on "Economic Factors in Chemical Industry."

Calco Chemical buys Williamsburg Chemical of Brooklyn.

Charles L. Read, formerly of Seaboard Chemical, joins Miner-Edgar.

TODAY the General Chemical Company organization is wholly mindful of the fact that first consideration *must* be given to the winning of the War. In increased production, in research and planning; in the development of new, essential products, the war effort stands first.

General Chemical Company realizes, however, the importance of the needs and problems of *non-defense* customers. And to these customers we say: We appreciate the consideration you have shown us in making allowances. You may feel confident that every conceivable measure is being taken to supply you with as much material as possible.

Meanwhile, the General Chemical Company organization is serving industry in these additional ways:

In Research: General Chemical Company is exerting every effort to develop *new* chemicals as well as to improve standard products.

In Education: COMBAT, General Chemical Company's dramatic sound motion picture in full natural color, is now out in the field from coast to coast. It is carrying to the farmer, in a most impressive and easily understood manner, vital information on the use of chemicals in the protection of his crops. It tells the grower, the *why* and *how* of controlling insects and fungous diseases to bring his acres into *maximum* production of *essential* foodstuffs.

In Technical Service: The Technical Service Division is putting its complete facilities into the work of better utilization of General Chemical products . . . assisting in the improvement of industrial processes and operations . . . helping adapt and develop substitutes for restricted materials.

PLEASE! Help us speed your deliveries. Return tank cars, carboys and returnable drums promptly.

GENERAL CHEMICAL COMPANY

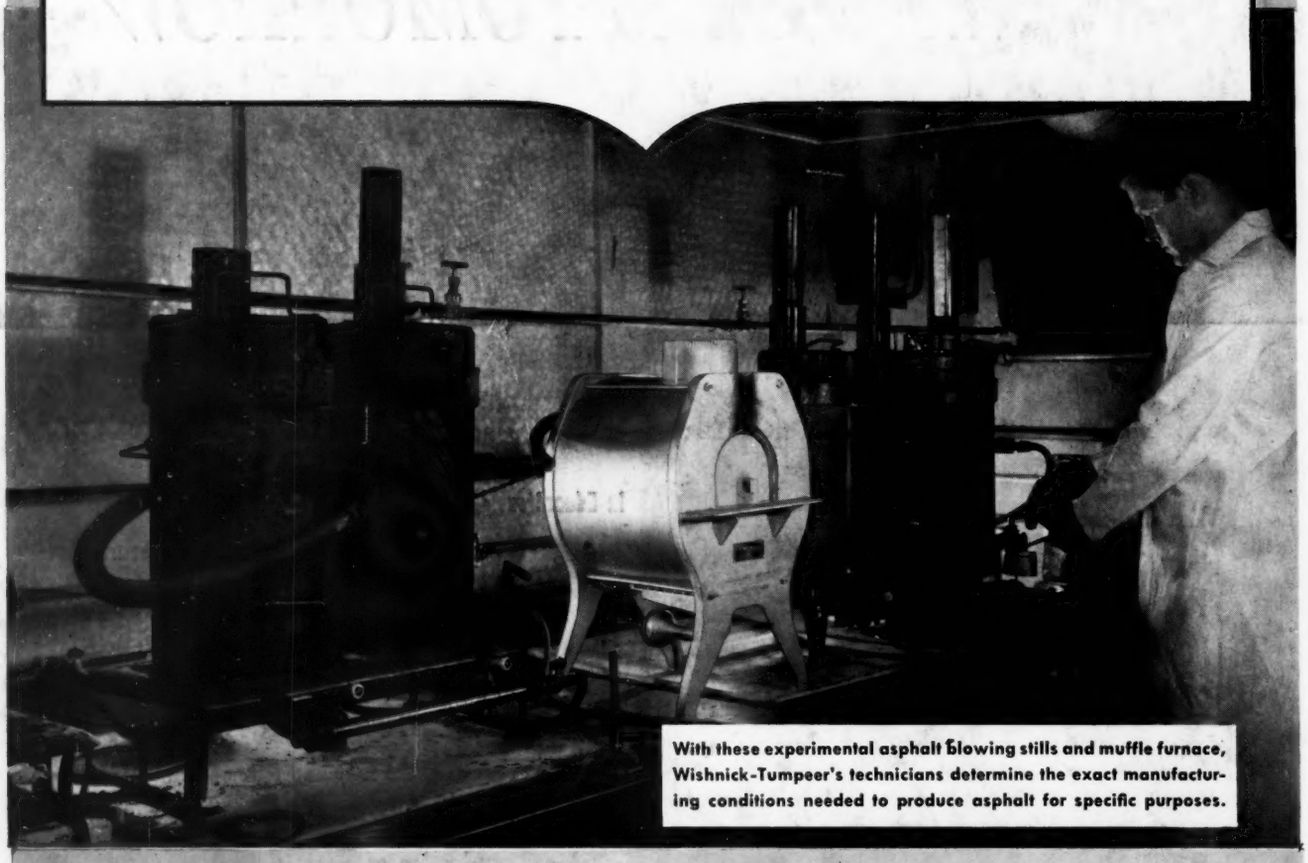
GENERAL CHEMICAL COMPANY

40 RECTOR STREET, NEW YORK, N. Y.

Offices: Atlanta • Baltimore • Boston • Bridgeport (Conn.) • Buffalo • Charlotte (N. C.) • Chicago • Cleveland • Denver • Detroit • Houston • Kansas City • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • Providence (R. I.) • St. Louis • Utica (N. Y.)
Pacific Coast Offices: San Francisco • Los Angeles
Pacific Northwest Offices: Wenatchee (Wash.) • Yakima (Wash.)
In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

★

ASPHALT SPECIALTIES IMMEDIATELY AVAILABLE!



With these experimental asphalt blowing stills and muffle furnace, Wishnick-Tumpeer's technicians determine the exact manufacturing conditions needed to produce asphalt for specific purposes.

Asphalt specialties, compounded to meet your requirements, can be delivered to you *promptly* from Wishnick-Tumpeer's two conveniently located plants!

Pioneer Asphalt Compounds are produced from carefully chosen raw materials . . . selectively blended and processed to exact specification . . . subjected to rigid laboratory inspection. These asphalts have been serving the nation's industries for 42 years, in the manufacture of such diversified products as rubber, paint, paper, insulating and waterproofing compounds. Today they are playing an even more vital role in the manufacture of submarine batteries . . . in the construction of underground hangars . . . in paving for airport runways, roads and streets . . . in protective coatings for shipping airplane parts . . . in electrical equipment and rubber products essential to victory. And skilled research technologists in Wishnick-Tumpeer's research laboratories are constantly at work developing new compounds for many other purposes.

If *you* need asphalt specialties—and need them in a hurry—bring your problem to us. We are ready to assist you in selecting or creating specifications for an asphalt that exactly meets your requirements—that can be delivered to you without delay—that will assure uninterrupted production in your plant. A complete line of asphalt paints is also available. Write for information.

WISHNICK-TUMPEER, INC.

MANUFACTURERS AND EXPORTERS

WITCO

New York, 295 Madison Ave. • Boston, 141 Milk St. • Chicago, Tribune Tower • Cleveland, 616 St. Clair Ave., N. E.
Witco Affiliates: Witco Oil & Gas Company • The Pioneer Asphalt Company • Panhandle Carbon Company
Foreign Office, London, England.

TECHNOLOGY DEPT:

CHEMICAL INDUSTRIES

Statistical and Technical Data Section

PUBLIC LIBRARY JUN 30 1942 DETROIT

State of Chemical Trade

Current Statistics (May 31, 1942)—p. 105

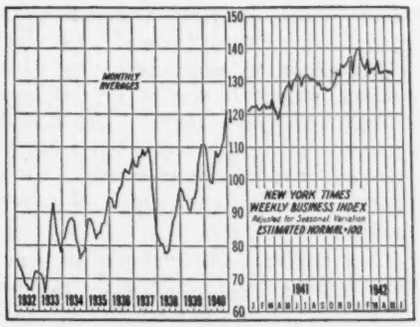
WEEKLY STATISTICS OF BUSINESS

Week Ending	Carloadings 1942	Carloadings 1941	Carloadings % of Change	Electrical Output* 1942	Electrical Output* 1941	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Fert. Mat.	Price Indices Mixed Fert.	Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
May 2	858,904	974,299	+ 8.1	3,304,602	2,944,906	+12.2	103.7	120.7	138.7	118.7	115.3	127.9	97.1	98.9	133.1	106.5
May 9	839,253	837,149	+ 0.3	3,365,208	3,003,921	+12.0	103.5	120.7	138.7	118.8	115.3	128.0	97.3	98.6	132.6	106.3
May 16	839,052	860,802	+ 2.5	3,356,921	3,011,345	+11.5	103.3	120.7	139.1	118.7	115.3	128.1	97.3	99.6	132.6	106.3
May 23	837,748	866,027	+ 3.3	3,379,985	3,040,029	+11.2	103.4	120.7	139.1	119.8	115.3	128.0	97.3	99.2	132.3	106.6

MONTHLY STATISTICS

CHEMICAL:	Mar. 1942	Mar. 1941	Feb. 1942	Feb. 1941	Jan. 1942	Jan. 1941
Acid, sulfuric **(expressed as 50° Baumé, short tons, Bureau of the Census)**						
Total prod. by fert. mfrs.	No Longer Available		.....	.....	.....	.....
Consumpt. in mfr. fert.	.....	.....	.....	.....	.....	.....
Stocks end of month	.....	.....	.....	.....	.....	.....
Alcohol, Industrial **(Bureau Internal Revenue)**						
Ethyl alcohol prod., proof gal..	No Longer Available		.....	.....	.....	.....
Comp. denat. prod., wine gal...	.....	.....	.....	.....	.....	.....
Removed, wine gal.	.....	.....	.....	.....	.....	.....
Stocks end of mo., wine gal...	.....	.....	.....	.....	.....	.....
Spec. denat. prod., wine gal. ...	.....	.....	.....	.....	.....	.....
Removed, wine gal.	.....	.....	.....	.....	.....	.....
Stocks end of mo., wine gal...	.....	.....	.....	.....	.....	.....
Ammonia sulfate prod., tons a..	65,216	64,524	58,592	58,360	65,548	64,669
Bensol prod., gal. *b*	No Longer Available		12,040,997	11,765,359	13,470,000	13,130,193
Byproduct coke, prod., tons a..	5,199,728	4,999,309	4,715,585	4,502,091	5,229,297	4,932,989
Cellulose Plastic Products **(Bureau of the Census)**						
Nitrocellulose sheets, prod., lbs.	1,006,242	844,819	922,605	720,173	1,113,319	719,336
Sheets, ship., lbs.	984,379	794,199	1,050,319	755,513	1,191,391	704,497
Rods, prod., lbs.	296,100	368,429	319,840	314,560	362,840	349,402
Rods, ship., lbs.	269,593	342,024	350,342	299,793	408,070	329,138
Tubes, prod., lbs.	131,920	99,345	134,158	97,399	141,438	97,794
Tubes, ship., lbs.	139,591	96,298	144,426	89,831	155,397	78,760
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	519,357	464,601	566,575	343,605	585,319	616,525
Shipments, lbs.	486,470	372,804	504,428	335,009	541,536	674,574
Molding comp., ship.; lbs. ...	3,444,374	1,990,982	3,224,519	1,641,978	3,597,003	1,583,885
Methanol **(Bureau of the Census)**						
Production, crude, gals.	No Longer Available		.....	.....	.....	.....
Production, synthetic, gals.	.....	.....	.....	.....	.....	.....
Pyrozylin-Coated Textiles **(Bureau of the Census)**						
Light goods, ship., linear yds...	3,972,491	3,806,132	4,069,499	3,466,902	3,929,757	3,056,526
Heavy goods, ship., linear yds..	2,679,692	3,294,035	2,228,561	3,032,393	2,681,248	2,824,339
Pyroxylin spreads, lbs. *c*	5,403,335	6,759,108	5,472,578	6,262,184	6,041,991	5,993,335
Exports **(Bureau of Foreign & Dom. Commerce)**						
Chemicals and related prod. *d*..	Exports and Imports No Longer Available				.....	.....
Crude sulfur *d*	.....	.....	.....	.....	.....	.....
Coal-tar chemicals *d*	.....	.....	.....	.....	.....	.....
Industrial chemicals *d*	.....	.....	.....	.....	.....	.....
Imports						
Chemicals and related prod. *d*..	.....	.....	.....	.....	.....	.....
Coal-tar chemicals *d*	.....	.....	.....	.....	.....	.....
Industrial chemicals *d*	.....	.....	.....	.....	.....	.....
Employment **(U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals**						
Chemicals and allied prod., including petroleum	153.7	131.6	153.0	128.5	148.9	126.3
Other than petroleum	159.5	134.6	158.7	130.8	153.7	128.1
Chemicals	185.9	159.3	188.1	155.1	186.6	152.0
Explosives	No Longer Available		Not Available		Not Available	
Payrolls **(U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals**						
Chemicals and allied prod., including petroleum	211.0	149.1	208.8	144.8	203.3	142.1
Other than petroleum	220.8	154.0	218.3	148.7	213.0	145.2
Chemicals	275.8	201.7	278.3	143.9	280.0	188.2
Explosives	No Longer Available		Not Available		Not Available	
Price index chemicals*	96.4	85.9	96.3	85.7	95.3	85.6
Drugs & Pharmaceuticals* ...	126.5	97.2	126.5	96.9	126.3	96.5
Fert. mat.*	79.5	70.4	79.3	70.4	78.6	70.7
Paint and paint mat.	100.8	87.4	99.9	86.6	99.1	86.7
FERTILIZER:						
Exports **(long tons, Nat. Fert. Association)**						
Fertiliser and fert. materials ...	Exports and Imports No Longer Available				.....	.....
Total phosphate rock	.....	.....	.....	.....	.....	.....
Total potash fertilisers	.....	.....	.....	.....	.....	.....
Imports **(long tons, Nat. Fert. Association)**						
Fertiliser and fert. materials ...	.....	.....	.....	.....	.....	.....
Sodium nitrate	.....	.....	.....	.....	.....	.....
Total potash fertiliser	.....	.....	.....	.....	.....	.....

INDUSTRIAL TRENDS



Business: Industrial and business activity has varied little in the last few months. As production for civilian goods slacked off the increasing conversion to war goods took up the slack. Since January the Federal Reserve Board's Index of Industrial Production has gone from 171 in that month to 174 in April. The *New York Times* index of business activity was 137.4 for week ending Jan. 3 and 132.0 for week ending May 30. This more or less stable first half was quite satisfactory considering the tremendous disruption caused by conversion.

However, it is true that indexes, in wartime, do not reflect a true measure of production. They are not designed to give away information concerning production of war materials, and so, although armament production has increased and will continue at a rapid pace, publicly printed indexes will probably advance slowly.

Steel: Ingot production continues to be maintained at exceptionally high rate. Operations during May averaged about 98.2% of capacity at which rate 7,386,890 tons were produced.

The industry is looking ahead to a tight squeeze in scrap next winter and is encouraging the gathering of a huge stockpile while the weather is good.

Carloadings: Loadings of revenue freight have continued high. Sharp increases in shipments of coal, forest products and iron ore more than offset declines of merchandise in less than carload lots.

Loadings in first 22 weeks of year totaled 17,674,236 as compared with 16,340,675 in 1941, an increase of 8.2%.

In anticipation of a continued increase in use of railroad shipping (because of submarine toll on ships and rubber and gasoline restrictions for

State of Chemical Trade
Current Statistics (May 31, 1942)—p. 105

State of Chemical Trade

Current Statistics (May 31, 1942)—p. 106

trucks) a plan may be worked out to avoid cross hauling of similar goods. In other words the East would be limited to Florida oranges and Maine potatoes. Thus the interchange of similar products between two distant sections would be prevented where the local supply was sufficient for each section.

Electric Output: Output during the four weeks of May averaged about 11.7% better than similar period last year.

Additions to power capacity have raised potential supply several per cent. This along with dimouts and interconnecting links between existing and expected sources of supply are expected to minimize the danger of power shortages this year.

Automotive: The number of new automobiles made available for rationing in June has been set at the same figure as the previous months of March, April and May. The quota is 40,000 for the forty eight states and the District of Columbia.

The application of automotive technology to mass production of war supplies is swelling deliveries into a huge stream. Orders now exceed $14,000,000,000 or 300% of annual peak output of peacetime. Deliveries of armaments are already estimated at above $1,400,000,000.

Construction: As reported by the F. W. Dodge Corp. the value of construction contracts awarded in April was about 20% below the high March total, reflecting a decline in publicly financed construction. Residential contracts decreased by 25% and for the month were at about the same level as last year. Awards for non-residential building increased slightly.

Retail Trade: According to the Federal Reserve Board, retail sales declined somewhat in April, following anticipatory buying during the first quarter of the year.

During first half of May sales showed a further decrease but were about 6% larger than a year ago. This does not represent an actual increase in physical volume as price increases amounted to about 20% over the year period.

Commodity Prices: On May 11 wholesale prices of most commodities were limited to highest level reached in March by the General Maximum Price Regulation. On May 18 similar limitations went into effect for retail prices. Beginning July 1 retail prices of related services will be limited.

Wholesale prices of farm products and basic foods, exempt from direct control, showed little change during April and first half of May.

MONTHLY STATISTICS (cont'd)

	Mar. 1942	Mar. 1941	Feb. 1942	Feb. 1941	Jan. 1942	Jan. 1941
FERTILIZER: (Cont'd)						
Superphosphate e (Nat. Fert. Association)						
Production, total	.....	.....	402,160	334,697	430,810	338,546
Shipments, total	.....	.....	582,594	350,343	358,574	231,808
Northern area	.....	.....	201,212	129,961	127,120	88,013
Southern area	.....	.....	381,382	220,382	231,454	143,795
Stocks, end of month, total	.....	.....	1,636,086	1,967,724	1,786,112	1,943,182
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	1,155,809	1,487,101	1,088,923	858,255	1,272,676	545,772
Total, 12 southern	1,062,473	1,367,307	1,006,150	765,196	1,030,349	520,644
Total, 5 midwest	93,336	119,794	82,773	93,059	242,327	25,128
Fertiliser employment *i*	173.2	140.9	159.1	113.2	120.0	103.8
Fertiliser payrolls *i*	177.3	116.9	155.4	92.8	118.3	85.5
GENERAL:						
Acceptances outst'd'g *f*	.....	.....	$190	$211	$197	$212
Coal prod., anthracite, tons	.....	.....	4,772,000	4,430,000	4,532,000	4,977,000
Coal prod., bituminous, tons	.....	.....	43,840,000	41,450,000	48,540,000	44,070,000
Com. paper outst'd'g *f*	$384	$263	$388	$240	$380	$232
Failures, Dun & Bradstreet	1,048	1,211	916	1,129	962	1,124
Factory payrolls *i*	181.9	131.2	178.2	126.8	173.2	120.7
Factory employment *i*	134.5	119.9	133.6	117.8	132.5	115.5
GENERAL MANUFACTURING:						
Automotive production	94,510	507,834	134,134	485,622	238,261	500,878
Boot and Shoe prod., pairs	45,105,652	43,153,556	40,006,504	38,005,922	39,827,550	36,631,597
Bldg. contracts, Dodge *j*	$610,799	$479,903	$433,557	$270,373	$316,846	$305,205
Newsprint prod., U. S. tons	80,923	87,376	76,234	79,720	84,628	89,124
Newsprint prod., Canada, tons.	295,835	275,769	278,101	245,607	311,904	261,298
Glass containers, gross‡	6,935,000	5,128,000	5,966,000	4,381,000	6,755,000	4,513,000
Plate glass prod., sq. ft.	5,564,717	18,266,400	5,600,379	15,664,200	9,143,983	19,350,100
Window glass prod., boxes	1,583,000	1,417,000	1,457,000	1,397,000	1,639,000	1,561,000
Steel ingot prod., tons	7,392,911	7,124,003	6,521,056	6,230,354	7,124,922	6,928,085
% steel capacity	98.2	99.6	96.0	96.5	94.7	96.9
Pig iron prod., tons	.....	.....	4,502,273	4,197,872	4,970,000	4,663,000
U.S. cons'pt. crude rub., lg. tons	No longer Available		.....	.....	.....	.....
Tire shipments	1,027,021	5,517,255	1,115,950	4,896,340	1,231,422	4,849,748
Tire production	1,156,410	5,685,559	1,112,907	5,161,267	1,368,787	5,486,296
Tire inventories	4,809,123	10,148,861	4,552,702	10,028,803	4,550,068	9,797,253
Cotton consumpt., bales	966,631	854,767	893,745	793,428	945,909	844,839
Cotton spindles oper.	23,096,479	22,806,104	23,077,722	22,769,368	23,077,352	22,829,220
Wool consumption *s*	52.9	53.0	47.6	47.0	50.3	46.9
Rayon deliv., lbs.	39,900,000	35,400,000	36,000,000	31,600,000	41,200,000	35,000,000
Rayon employment *i*	312.5	312.2	312.6	311.0	314.5	313.5
Rayon payrolls *i*	393.9	332.9	391.3	327.6	392.0	335.9
Soap employment *i*	92.5	90.7	91.6	89.8	90.8	85.9
Soap payrolls *i*	136.4	114.8	135.1	112.6	132.9	107.7
Paper and pulp employment *i*	129.3	118.5	129.5	117.3	129.5	115.7
Paper and pulp payrolls *i*	175.2	136.4	174.0	132.5	172.3	127.5
Leather employment *i*	97.4	89.1	97.3	88.1	96.4	85.8
Leather payrolls *i*	123.7	94.3	122.3	92.3	119.7	86.7
Glass employment *i*	125.0	119.5	126.0	115.8	128.9	114.4
Glass payrolls *i*	172.7	140.5	171.2	135.3	171.2	131.0
Rubber prod. employment *i*	99.3	102.8	99.0	100.7	100.6	98.8
Rubber prod. payrolls *i*	134.7	119.5	127.4	115.3	134.9	111.6
Dyeing and fin. employment *i*	137.8	142.0	136.8	139.7	133.7	134.9
Dyeing and fin. payrolls *i*	150.5	133.3	148.8	128.8	141.0	120.2
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)[1]	.....	93.7	.....	83.6	.....	82.4
Gasoline prod., *p*	.....	.....	51,612	48,374	60,035	52,542
Cottonseed oil consumpt., bbls.	225,288	317,622	254,778	298,781	277,038	369,463
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments, dollars	$48,070,117	$40,185,294	$45,175,827	$33,690,870	$47,044,491	$34,604,629
Trade sales (580 estbts.) dollars	$23,718,650	$19,565,515	$22,126,413	$15,767,081	$22,842,005	$16,314,158
Industrial sales, total, dollars	$18,897,968	$17,033,354	$17,618,656	$14,973,684	$19,190,138	$15,092,044
Paint & Varnish, employ. *i*	140.8	132.9	141.1	128.6	140.7	126.3
Paint & Varnish, payrolls *i*	179.2	147.4	176.4	141.7	172.8	137.4

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted; 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census, in millions of lbs.; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; **Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; *New series beginning March, 1940; [1] Revised series beginning February, 1940.

United Carbon Earns $1.31

Current assets of United Carbon Co. and subsidiaries as of March 31, 1942, including $1,170,899 cash, amounted to $4,269,679 and current liabilities were $1,561,711, comparing with cash of $1,853,030, current assets of $4,372,407 and current liabilities of $1,510,898 on March 31, 1941. Inventories were $1,877,016 against $1,108,733.

Vick Chemical Nets $2,458,752

Vick Chemical Co. and subsidiaries report for nine months ended March 31, 1942, net profit of $2,458,752 after depreciation, provision of $1,385,976 for federal and foreign income and excess profits taxes, etc. Above net is equal to $3.61 a share on 681,180 shares of capital stock.

This compares with net profit of $2,576,887 or $3.78 a share on 682,380 shares reported for the nine months ended March 31, 1941.

Commercial Alcohol Earnings Up

Commercial Alcohols Ltd. in report for fiscal year ended March 31, 1942, shows net profit of $90,111 after depreciation, interest, income and excess profits taxes, etc., equal after preferred dividends, to 35 cents a share on 200,515 shares of common stock.

This compares with $73,515 or 28 cents a share on 193,845 common shares in preceding year.

Mathieson Report $344,861

Mathieson Alkali Works, Inc. in report for quarter ended March 31, 1942, shows net profit of $344,861 after depreciation, depletion, provision of $345,000 for federal taxes, etc. Above net is equal after dividend requirements on 7% preferred stock, to 37 cents a share on 828,171 shares of common stock.

This compares with net profit of $403,515 or 44 cents a common share in March quarter of previous year, when federal tax provision was $180,000.

du Pont Pays $1.18

E. I. du Pont de Nemours & Co. reports earnings on its common stock of $1.18 a share for quarter ended March 31, 1942. These earnings are after federal income taxes and provision of $6,000,000 for contingencies.

In March quarter of preceding year, company reported earnings of $1.77 a share on common, after federal taxes and provision of $3,500,000 for contingencies.

For each period the provision for federal income taxes was based on the law existing at March 31.

Corn Products

Corn Products Refining Co. and its subsidiary sales companies in report for quarter ended March 31, 1942, subject to annual audit and year-end adjustments, show net profit of $2,151,344 after depreciation, federal income and excess profits taxes, etc., equal after dividend requirements on 7% preferred stock, to 68 cents a share on 2,530,000 shares of common stock.

This compares with $2,496,983 or 81 cents a common share for quarter ended March 31, 1941.

Provision for federal income taxes for the March quarter at 45% amounted to $2,085,000 and that for excess profits taxes, based on recommendation of treasury department, amounted to $4,050,000.

NOPCO Earns $187,350

National Oil Products Co. in report for quarter ended March 31, 1942, shows net profit of $187,350 after charges and federal income taxes at current rates and an additional $50,000 extra reserve for expected increase in rates. Above net is equal to 87 cents a share on 215,794 shares of capital stock.

This compares with revised net profit of $139,707 or 65 cents a share in March quarter of previous year.

Commercial Solvents Nets $547,181

Commercial Solvents Corp. reports for quarter ended March 31, 1942, consolidated net profit of $547,181 after charges and federal income and excess profits taxes, including reserve of $336,000 in excess of provision required at current rates. Above net is equal to 21 cents a share on 2,636,878 shares of capital stock.

This compares with net profit of $556,992 or 21 cents a share in March quarter of previous year.

Chemical Fund Earns $7,556,426

Chemical Fund, Inc. in report for the fiscal year ended March 31, 1942, certified by independent auditors, states that, based on quoted market values of securities, net assets at close of period amounted to $7,556,426, equal to $7.54 a share (par $1) on 1,002,107 shares of capital stock.

This compares with net assets of $7,852,061 or $8.69 a share on 903,214 shares on March 31, 1941.

Dividends and Dates

Name	Per Share	Stock Record	Payable
Abbott Laboratories,			
Com., (quar.)	.40	6-11	6-30
Extra	.10	6-11	6-30
4% pref. (quar.)	1.00	7-1	7-15
Allied Chemical & Dye Corp. (quar.)	1.50	6-5	6-20
Amer. Agricultural Chem. Co.	.30	6-16	6-30
Amer. Cyanamid Co.			
Class A, (quar.)	.15	6-12	7-1
Class B, (quar.)	.15	6-12	7-1
5% pref. (quar.)	1.25	6-12	7-1
Amer. Smelting & Refining, Com.	.50	8-7	8-31
7% 1st pref. (quar.)	1.75	7-3	7-31
Climax Molybdenum Co.	.30	6-19	6-30
Clorox Chemical Co. (quar.)	.75	6-15	6-25
Comm'l Alcohols, Ltd.			
Com.	.05	6-30	7-15
8% pref. (quar.)	.10	6-30	7-15
Comm'l Solvents Corp. (irregular)	.30	6-5	6-30
Diamond Alkali Corp. (quar.)			
6% participating pref. (s-a.)	.75	8-11	9-1
du Pont (E. I.) de Nemours & Co.			
Com. (interim)	1.00	5-25	6-13
$4.50 pref. (quar.)	1.125	7-10	7-25
Durez Plastics & Chem.			
Com.	.50	5-26	6-15
6% pref. (quar.)	.375	5-26	6-15
Eastman-Kodak Co.,			
Com. (quar.)	1.50	6-5	7-1
6% pref. (quar.)	1.50	6-5	7-1
Gen. Printing Ink Corp.			
$6.00 pref. (quar.)	1.50	6-16	7-1
Harshaw Chemical Co.			
(quar.) (reduced)	.25	6-15	7-1
McKesson & Robbins,			
5¼% pref. (quar.)	1.31¼	6-6	6-15
Mathieson Alkali Works,			
Inc., Com. (red.)	.25	6-8	6-30
7% pref. (quar.)	1.75	6-8	6-30
Merck & Co., Inc.,			
Common	.25	6-20	7-1
4½% pref. (quar.)	1.125	6-20	7-1
5½% pref. (quar.)	1.31¼	6-20	7-1
Metal & Thermit Corp.			
Com. (irregular)	.35	6-1	6-10
7% pref. (quar.)	1.75	6-20	6-30
Mutual Chem. Co. of America			
6% pref. (quar.)	1.50	6-18	6-27
6% pref. (quar.)	1.50	9-17	9-28
6% pref. (quar.)	1.50	12-17	12-28
Pittsburgh Plate Glass Co.	.75	6-10	7-1
Potash Co. of Amer.	.50	6-15	7-1
Procter & Gamble Co.			
5% pref. (quar.)	1.25	5-25	6-15
Standard Oil of N.J.			
(S. A.)	.50	5-15	6-15
Extra	.50	5-15	6-15
Texas Co. (quar.)	.50	6-5	7-1
Texas Gulf Sulphur Co. (quar.)	.50	6-1	6-15
Union Carbide & Carbon Corp.	.75	6-5	7-1
W. Virginia Pulp & Paper Co.	.25	6-15	7-1

Price Trend of Representative Chemical Company Stocks

	May 2	May 9	May 16	May 23	Net gain or loss last mo.	Price on May 25, 1941	1940 High	1940 Low
Air Reduction	31¼	32½	31½	30⅞	— ⅝	38⅞	38¾	29½
Allied Chemical & Dye Corp.	121½	124	124¼	124	+ 2½	140½	149	118½
Amer. Agric. Chem.	21	20½	20	21	.....	13	23⅝	19
Amer. Cyanamid "B"	30⅛	29⅜	30	29¾	— ⅜	29⅞	41⅞	28⅝
Columbian Carbon	65	63½	67½	67	+ 2	74	72	51
Commercial Solvents	8	7½	7¾	8	.....	8¾	9¾	7¼
Dow Chemical Co.	98	99	97¾	99	+ 1	139½	124¼	95
duPont	107¾	110¾	109½	107	— ¾	153	144	102¾
Hercules Powder	56½	57	57¼	59	+ 2½	79⅞	72	51
Mathieson Alkali Works	21	21	20	21	.....	23	29½	20
Monsanto	68	69	67¼	67⅝	— ⅜	90½	91	66
Standard Oil of N. J.	32⅛	34⅜	34⅛	34⅛	+ 2	32½	42¼	30½
Texas Gulf Sulphur	28⅛	28⅞	29½	29	+ ⅞	29	34⅞	28
Union Carbide & Carbon	60½	61	61½	61⅞	+ 1⅜	64	74¾	58
United Carbon Co.	37¾	39½	39	39	+ 1¼	....	44	37
U. S. Industrial Alcohol	26¼	26¼	27	27	+ ¾	16½	34¼	24½

Chemical Finances
May, 1942—p. 107

Chemical Stocks and Bonds

PRICE RANGE 1942 May Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Stocks	Par $	Shares Listed	Dividends 1941*	Earnings** $-per-share-$ 1941	1940	1939
NEW YORK STOCK EXCHANGE													
40	49⅞	37	55¾	46	70¼	49¼	Abbott Labs.	No	755,204	1.60	2.90	2.89	2.61
31⅛	38¼	29½	45	34⅝	58⅛	36½	Air Reduction	No	2,736,855	2.00	2.62	2 38	1.98
128	149	118½	167½	135	182	135½	Allied Chem. & Dye	No	2,401,288	6.00	9.67	9.43	9.50
20½	23⅝	19	22⅞	14⅜	21	12⅛	Amer. Agric. Chem.	No	627,981	1.45	1.79	1.45	1.22
8⅞	9¾	7½	9⅞	4⅝	8¼	4⅛	Amer. Com. Alcohol	No	260,934	...	4.03	.22	—.38
30	35	27⅜	35	26	35½	23	Archer-Dan.-Midland	No	545,416	1.85	5.69	5.42	3.02
44	70	43	72¼	61	80½	57	Atlas Powder Co.	No	254,827	4.50	6.13	5.71	3.82
112	116	111	121	111	124¾	112½	5% conv. cum. pfd.	100	68,597	5.00	27.77	26.01	18.94
18⅜	21¼	15	20⅜	18½	35½	20	Celanese Corp. Amer.	No	1,376,551	2.00	3.43	2.90	3.53
115¼	120⅝	110	122¼	116¾	121	105½	prior pfd.	100	164,818	7.00	35.08	38.69	38.67
13½	13⅞	11½	16¼	10⅞	20	10⅛	Colgate-Palm.-Peet	No	1,962,087	0.50	3.09	1.62	2.74
66	72	51	83	64	98¾	71	Columbian Carbon	No	537,406	4.70	6.57	5.71	5.32
8¼	9¾	7¼	11⅞	7½	16⅝	8	Commercial Solvents	No	2,636,878	0.55	.99	.91	.61
48¼	55⅝	42¼	55⅝	43¾	65⅛	40¾	Corn Products	25	2,530,000	3.00	3.37	3.10	3.32
169½	174	159	182½	164	184	165	7% cum. pfd.	100	245,738	7.00	41.78	7.23	7.70
17	21	14	21	12¼	23¼	12½	Devoe & Rayn. A.	No	95,000	1.00	7.08	1.14	2.08
101	124¼	95	141⅜	111⅛	171	127¼	Dow Chemical	No	1,135,187	3.00	6.58	6.65	3.76
107½	144	102¾	164⅜	125⅛	189¼	146½	DuPont de Nemours	20	11,065,762	7.00	7.50	7.23	7.70
122¾	126½	120	127	120⅞	129⅝	114	4½% pfd.	No	1,688,850	4.50	53.53	51.48	52.25
120½	141	108	145½	120¼	166¾	117	Eastman Kodak	No	2,488,242	6.00	8.57	7.96	8.55
172½	176	170	183⅜	160	180	155	6% cum.	100	61,657	6.00	350.14	325.62	337.65
32⅜	38¾	27	41	32½	39¼	34¾	Freeport Sulphur	10	796,380	2.00	3.95	3.81	2.76
4¾	5¾	4½	7½	4⅞	10	5½	Gen. Printing Ink	1	735,960	0.65	1.00	.86	.94
14⅞	15	12½	17⅞	11	19¾	11	Glidden Co.	No	829,989	1.50	3.08	1.56	1.70
40	44	37¾	46	35	45	30	4½% cum. pfd.	50	199,940	2.25	15.08	8.64	9.27
80	93½	79¼	96	76	113¼	89⅞	Hazel Atlas	25	434,409	5.00	6.63	5.98	6.60
59⅛	72	51	80¾	65¼	100½	69	Hercules Powder	No	1,316,710	3.00	4.23	4.01	3.65
128	129¼	125	132⅛	123½	133⅛	126¼	6% cum. pfd.	100	96,194	6.00	69.71	66.38	60.87
23	27	21	29⅞	20¾	29	16⅝	Industrial Rayon	No	759,325	2.50	3.04	3.51	1.77
21¼	23½	19¾	27	19	47⅝	21¼	Interchem.	No	290,320	1.60	6.01	2.47	4.10
104½	111½	103	113¼	107	113	91	6% pfd.	100	65,661	6.00	32.79	16.99	24.27
3½	5	3⅝	..	..	..	..	Intern. Min. & Ch.	5	473,981	...	...	...	...
41	41½	38	..	..	..	..	4% cum. pfd.	100	100,000	...	...	...	...
26⅜	28¾	24⅛	31⅜	23	38⅞	19⅜	Intern. Nickel	No	14,584,025	2.00	2.22	2.30	2.39
41	48¼	39	49	38¼	39⅝	26⅞	Intern. Salt	No	240,000	3.00	3.76	3.98	1.92
18⅝	20⅝	17½	22	17¼	23⅝	14⅜	Kellogg (Spencer)	No	509,213	1.70	...	...	1.39
25⅜	26¼	20½	45⅜	19⅛	53⅜	30	Libbey Owens Ford	No	2,513,258	3.50	3.52	3.97	3.21
12⅝	15½	11⅜	16⅝	13	18⅝	10⅛	Liquid Carbonic	No	728,100	1.00	2.92	2.21	1.62
21½	29½	20	31¼	24⅛	32¾	21	Mathieson Alkali	No	828,171	1.50	1.90	1.72	1.12
68¾	91	66	94	77	119	79	Monsanto Chem.	No	1,241,816	3.00	4.90	4.32	4.01
112½	117½	110	118⅛	112	119	110	4½% pfd. A.	No	50,000	4.50	38.43	57.38	54.29
115	119	112	123	115	123	113½	4½% pfd. B.	No	50,000	4.50	38.43	57.38	54.29
105	110¾	102½	113¾	106⅞	...	...	4 % pfd. C.	No	50,000	4.50	38.43	...	...
13¼	16¼	11⅞	19¾	12¼	22½	14⅛	National Lead	10	3,090,664	0.50	1.10	1.34	1.23
148½	168	145	176	100½	176	160	7% cum. "A" pfd.	100	213,793	7.00	24.68	28.54	27.04
134	146	129	154	138	153¾	132	6% cum. "B" pfd.	100	103,277	6.00	49.99	59.46	55.30
31	35	29½	36	26	44	23¾	National Oil Products	4	179,829	1.95	4.11	3.92	3.89
7½	11⅜	7¼	11⅞	5⅝	14¼	6⅛	Newport Industries	1	621,359	0.75	1.14	0.50	0.66
47⅛	54	43¼	54	38⅜	64⅝	42	Owens-Illinois Glass	12.50	2,661,204	2.50	3.40	2.71	3.17
44¾	52	42	61⅛	47½	71⅝	53	Procter & Gamble	No	6,409,418	2.00	4.20	4.37	3.80
115¾	119	115	120	115	118½	112½	5% pfd.	100	169,517	5.00	324.38	336.78	298.55
11⅛	14¾	10⅛	16⅜	10⅛	13⅞	7⅝	Shell Union Oil	No	13,070,625	1.00	1.33	1.05	0.77
22¼	28½	19⅝	35¼	18⅞	23¼	12¼	Skelly Oil	No	981,349	1.50	6.03	3.28	1.99
21½	27½	20	34¼	24⅞	29	20¾	S. O. Indiana	25	15,272,020	1.00	3.17	2.20	2.24
34⅞	42¼	30½	46⅞	33	46½	29⅞	S. O. New Jersey	25	27,278,666	1.00	5.15	4.54	3.27
7⅝	9⅜	7½	9⅝	6	9¼	4¼	Tenn. Corp.	5	853,696	1.00	1 60	1.36	0.41
33	39¼	30	46⅝	34½	47⅝	33	Texas Corp.	25	10,876,882	2.00	4.77	2.90	3.02
29⅛	34⅞	28	38⅞	30⅛	37¼	26⅞	Texas Gulf Sulphur	No	3,840,000	2.50	2.35	2.38	2.04
63½	74¾	58	70⅞	60	88⅝	59⅞	Union Carbide & Carbon	No	9,277,288	3.00	4.53	4.55	3.86
40	42⅞	37	52	35	65⅝	42½	United Carbon	No	397,885	3.00	4.30	3.36	3.81
26	34¼	24½	34⅛	20	28	14	U. S. Indus. Alcohol	No	391,238	1.00	...	2.73	1.06
15	20⅞	14⅝	34⅛	15½	43⅞	25	Vanadium Corp. Amer.	No	405,706	1.50	3.03	2.85	3.25
19⅜	25½	18¾	27¼	20	31½	14	Victor Chem.	5	750,000	1.40	1.59	1.57	1.59
1½	2⅛	1	2½	⅝	4½	1⅝	Virginia-Caro. Chem.	No	486,122	...	—1.89	—1.36	—1.57
30½	30	22½	29½	18⅞	31⅝	14	6% cum. part. pfd.	100	213,052	1.00	1.69	2.89	2.41
25	31½	22	36½	27¼	38½	27¾	Westvaco Chlorine	No	553,132	1.85	2.92	2.96	2.91
101	106½	101	113	105	109⅞	108	cum. pfd.	No	58,415	4.50	22.19	21.98	...
NEW YORK STOCK EXCHANGE													
31½	41⅞	29⅛	42⅝	31	39⅞	26	Amer. Cyanamid "B"	10	2,618,387	0.60	2.42	2.44	2.07
7⅜	7⅝	6⅞	7⅝	6⅜	8⅛	5	Duval Texas Sulphur	No	500,000	1.25	1.42	1.16	1.25
68	88½	68	99	65	92	60	Heyden Chem. Corp.	100	104,983	3.00	9 04	7.86	5.98
64½	64½	55¼	96¼	55	104	65	Pittsburgh Plate Glass	25	2,188,040	5.00	6.82	6.30	4.94
67½	70	59¾	84	61	100	62½	Sherwin Williams	25	638,927	3.00	7.83	6.57	5.96
111¾	113	110	115½	106½	114¾	106	5% cum. pfd.	50	122,289	5.00	47.82	39.49	35.08
PHILADELPHIA STOCK EXCHANGE													
149	175½	135	185	162	192	158¾	Pennsylvania Salt	50	150,000	8.00	10.99	11.51	8.63

PRICE RANGE 1942 May Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE											
102	104¼	101¾	104½	100¾	105¼	100½	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
42½	42½	34	42¼	26¼	41	27½	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
41	41	35	40	25¾	39¾	27	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
96¾	97⅞	95¾	99⅞	94¾	100¼	93½	Shell Union Oil	1954	2½	J-J	85,000,000
104	105½	103½	106¾	102¼	107	101¼	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
103¾	105⅝	103¾	150⅝	103	107	100⅝	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
105	105¾	104½	107⅞	102⅞	108¼	103	Texas Corp.	1959	3	A-O	40,000,000

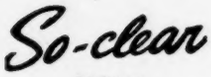
* Including extras paid in cash.
** For either fiscal or calendar year.
x New stock.

New Trade Marks of the Month

395,001

FUNGI-STICK
395,010

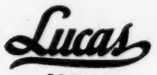
SKIN FILM
395,011



395,196

Houston's
DERRIS
MIXTURE
395,511

395,514



395,522

Granulex Process
436,996

439,007

CAMEO
CORPORATION
CLEANSER
441,557

441,558

441,586

441,638

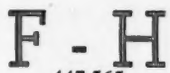
441,824

443,362

443,483

443,832

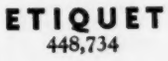
444,241



447,565

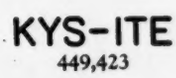
447,989

448,389



448,734

448,822

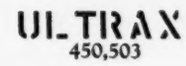


449,423

450,153

450,172

450,229



450,503

450,513

450,539

450,728

450,753

450,754

450,838

450,987

450,989

Trade Mark Descriptions †

395,010. Dome Chemicals, Inc.; New York, N. Y.; Feb. 24, '41; for medicines and pharmaceutical preparations for the treatment of the skin and scalp; since Feb. 15, '41.

395,011. Dome Chemicals, Inc.; New York, N. Y.; Feb. 24, '41; for medicines and pharmaceutical preparations for the treatment of the skin and scalp; since Feb. 14, '41.

395,511. Sam Houston Brokerage Co.; Birmingham, Ala.; July 1, '41; for insecticides; since Jan. 1, '37.

395,514. The Neville Co.; Pittsburgh, Pa. and Neville Island, Pa.; Aug. 20, '41; for paste-type paint and varnish remover; since March, '41.

395,522. John Lucas & Co., Inc.; Philadelphia, Pa.; Jan. 15, '42; for insecticides and fungicides; since Jan., '23.

436,996. Granular Foods, Inc.; New York, N. Y.; Oct. 17, '40; for preparation of coconut dextrose and other ingredients for making a food beverage; since Aug. 28, '40.

439,007. Aktiebolaget Lauxein - Casco; Stockholm, Sweden; Dec. 19, '40; for seed disinfectants and impregnations for wood, textiles and other porous stuffs to protect them against moisture, rot, mould, insects, and fire; since Feb. 15, '40.

441,557. Cameo Corporation; Chicago, Ill.; Mar. 14, '41; for preparation used as a general household cleanser; since Feb. 19, '41.

441,558. Cameo Corporation; Chicago, Ill.; Mar. 14, '41; for preparation used as a general household cleanser; since Feb. 19, '41.

441,586. Merz & Co.; Chemical Works, Inc.; Newark, N. J.; Mar. 15, '41; for chemical preparations; since Mar. 17, '30.

441,638. The Pure Oil Co.; Chicago, Ill.; Mar. 17, '41; for soluble oil for use as cutting oil; since June 1, '30.

441,824. L. & L. Products; Chicago, Ill.; Mar. 22, '41; for cleaning powder preparation used for removing rust and like stains from chromium and nickel plating and for polishing purposes; since Jan. 17, '41.

443,362. Kepec Chemical Corp.; Milwaukee, Wisc.; May 8, '41; for tanning agents for use in the leather industry; since Jan. 7, '41.

443,483. Emery Industries, Inc.; Cincinnati, Ohio; May 12, '41; for solid fatty bodies such as stearic acid and the like; since 1926.

443,832. A B C Co.; New York, N. Y.; May 23 '41 for vegetable soap; since Mar. 27, '37.

444,241. Stauffer Chemical Co., Inc.; San Francisco, Calif., and New York, N. Y.; June 5, '41; for sulfur; since Apr. 5, '41.

445,686. Commercial Solvents Corp.; New York, N. Y.; July 28, '41; for radiator preparations—namely, anti-leak compounds, anti-rust compounds, and flushing compounds; since June 13, '41.

447,565. Frank Harris Laboratories; Los Angeles, Calif.; Oct. 7, '41; for polish for furniture, automobiles, and the like; since July 17, '41.

447,989. Clarence H. Stone Co.; Lynnfield Center, Mass.; Oct. 21, '41; for solvent soap and water-proofing agents for leather; since Mar. 7, '42.

448,389. Frederic Lambert; New York, N. Y.; Nov. 4, '41; for hand cleaner soap powder; since Oct. 15, '41.

448,734. Lehn & Fink Products Corp.; Bloomfield, N. J.; Nov. 18, '41; for anti-perspirant and deodorant cream; since Oct. 28, '41.

448,822. E. I. du Pont de Nemours & Co., Wilmington, Del.; Nov. 22, '41; for explosive rivets; since Jan. 15, '41.

449,423. Keyes Fibre Co.; Waterville, Maine; Dec. 12, '41; for molding compound; since Mar. 22, '40.

450,153. American Cyanamid & Chemical Corp.; New York, N. Y.; Jan. 12, '42; for chemical preparation for treatment of oil well drilling muds; since Jan., '41.

450,172. The Wayne Soap Co., Detroit, Mich.; Jan. 12, '42; for liquid protective coating in the nature of a lacquer for the surface of metal, wood, leather, paper, cardboard, rubber, plastics and other materials; since Oct. 10, '41.

450,229. Huntington Laboratories, Inc.; Huntington, Ind.; Jan. 15, '42; for liquid soap for cleansing wood, linoleum, terrazzo, marble, tile, and similar surfaces; since May 25, '35.

450,503. The Atlantic Refining Co.; Philadelphia, Pa.; Jan. 27, '42; for petroleum waxes; since July 9, '34.

450,513. National Foam System, Inc.; Philadelphia, Pa.; Jan. 27, '42; for fire extinguishing chemicals and compositions; since Sept. 18, '41.

450,539. Hercules Powder Co.; Wilmington, Del.; Jan. 28, '42; for resin for use in varnishes, synthetic resins, inks, adhesives, core oils resinates and other uses where high-melting-point, non-crystallizing resin is required; since Sept. 12, '41.

450,728. Fred Deligurori; Washington, D. C.; Feb. 4, '42; for cleaning compound; since Dec. 1, '41.

450,753. Turco Products, Inc., Los Angeles, Calif.; Feb. 4, '42; for detergent cleaning compounds especially useful in the cleaning of metal, painted surfaces and the like; since Dec. 2, '37.

450,754. Turco Products, Inc.; Los Angeles, Calif.; Feb. 4, '42; for compound for cleaning automotive and aircraft engine parts and for other detergent purposes; since Feb. 15, '38.

450,838. Sharp & Dohme, Inc.; Philadelphia, Pa.; Feb. 7, '42; for extracts of digitalis; since Dec. 4, '41.

450,987. American Oil Co.; Baltimore, Md.; Feb. 16, '42; for soap and cleaning solvent for use as a general grease solvent and dirt remover; since Jan. 22, '33.

450,989. American Oil Co.; Baltimore, Md.; Feb. 16, '42; for soap and cleaning solvent for use as a general grease solvent and dirt remover; since Jan. 22, '33.

† Trademarks reproduced and described include those appearing in the *Official Gazette* of the *U. S. Patent Office*, May 5 to May 26.

New Trade Marks of the Month

WHITE SAIL
451,035

majOr-B
451,454

LAMINETS
451,699

SURF-AC
451,832

CONSTRUCTO-GLO
451,872

BE-DUL-CE
451,108

POWDOLOY
451,502

ViTONE
451,740

DIGIFORTIS
451,847

Organoaide
451,890

SUNOTEX
451,125

MAIN-TEEN
451,518

Soludri
451,760

LIPO-LUTIN
451,848

WULTEX MIXTURE
451,922

ROXANEAL
451,147

BIOTOSE
451,530

SNOFIL
451,767

MYCOZOL
451,849

CAJEDROL
451,944

PANCAL
451,166

Vitaraal's
451,544

BEADOXIN
451,781

DERMAMENT
451,850

"HERMOX"
451,974

IVORY SOAP
PROCTER & GAMBLE
451,181

SO-DYE-CO
451,558

DIVITAN
451,786

KAPSEALS
451,852

ATCO
451,997

MOTOR VITAMIN
THE ABC OF MOTOR PERFORMANCE
451,569

TREMGARD
451,787

BOMB SHELL
451,232

GLOSSITE
451,792

Saniflamed
451,861

Shellalloy
452,090

ADIOS
451,795

STERIDOL
451,640

fizz-o-foam
451,377

MILLIMAR
451,698

Kodak
451,804

BENICOT
451,869

AJAX
445,686

451,035. The Great Atlantic & Pacific Tea Co.; New York, N. Y.; Feb. 17, '42; for household cleanser; since Sept. 18, '40.

451,108. Hoffmann-La Roche, Inc.; Nutley, N. J.; Feb. 21, '42; for medicinal preparation recommended for general use in vitamin deficiencies; since Jan. 29, '42.

451,125. Sun Oil Co.; Philadelphia, Pa.; Feb. 20, '42; for lubricating oils for textiles; since May 12, '41.

451,147. Roxalin Flexible Lacquer Co., Inc.; Elizabeth, N. J.; Feb. 21, '42; for coating material in the nature of a paint or lacquer to be applied to window glass, skylights, etc., to render the same shatterproof; since Jan. 23, '42.

451,166. Endo Products, Inc.; New York, N. Y.; Feb. 23, '42; for preparation of calcium pantothenate for deficiencies of pantothenic acid, a member of the vitamin B complex; since Feb. 1, '42.

451,181. The Procter & Gamble Co.; Cincinnati, Ohio; Feb. 23, '42; for soap; since Oct., '39.

451,232. Hanley and Kinsella Laboratories, Inc.; St. Louis, Mo.; Feb. 26, '42; for non-spray liquid insecticide; since Feb. 16, '42.

451,377. Banson Products Co.; Los Angeles, Calif.; Mar. 4, '42; for scented effervescent foaming bath powder used as a substitute for soap; since Nov. 15, '40.

451,454. Standard B. Vitamins, Inc.; New York, N. Y.; Mar. 6, '42; for vitamin tablets; since Jan. 23, '42.

451,502. Powder Metals and Alloys, Inc.; New York, N. Y.; Mar. 8, '42; for metal powders; since Feb. 9, '42.

451,518. Von Schrader Mfg. Co.; Racine, Wisc.; Mar. 9, '42; for dry cleaning powder for rugs; since Jan. 28, '42.

451,530. Ciba Pharmaceutical Products, Inc.; Summit, N. J.; Mar. 10, '42; for pharmaceutical vitamin preparation; since Jan. 20, '42.

451,544. Vitapep Products, Inc.; Los Angeles, Calif.; Mar. 6, '42; for prepared therapeutic vitamin supplement for pets; since Nov. 3, '41.

451,558. Southern Dyestuff Corporation; Charlotte, N. C.; Mar. 11, '42; for various chemicals—namely, softening agents, penetrants, dyestuff developers, and reducing agents, retarding agents, "sanforizing" oils, and finishing agents; since Oct. 13, '36.

451,569. Marion Francis Kelly; Richmond, Ind.; Mar. 12, '42; for liquid solvent particularly adapted for increasing motor performance; since Dec. 1, '41.

451,640. The C. B. Dolge Co.; Westport, Conn.; Mar. 16, '42; for cutting oil germicide; since Nov. 1, '41.

451,698. R. T. Vanderbilt Co., Inc.; New York, N. Y.; Mar. 17, '42; for material used in compounding natural, synthetic and reclaiming rubber; since Mar. 10, '42.

451,699. The Viavi Co.; San Francisco, Calif.; Mar. 17, '42; for concentrated vitamins; since Feb. 12, '42.

451,740. Archer Dental Mfg. & Supply Co.; Chicago, Ill.; Mar. 18, '42; for acrylic denture material; since Dec., '39.

451,760. Schenley Distilleries, Inc.; New York, N. Y.; Mar. 18, '42; for distillers' dried corn solubles for use as cattle feed and/or as an ingredient thereof; since Dec. 19, '41.

451,767. General Chemical Co.; New York, N. Y.; Mar. 20, '42; for calcium sulfate; since Feb. 2, '42.

451,781. Premo Pharmaceutical Laboratories, Inc.; New York, N. Y.; Mar. 20, '42; for preparation of pyridoxine hydrochloride for treatment of deficiency in B complex factors; since Sept., '40.

451,786. The Tannin Corp.; New York, N. Y.; Mar. 20, '42; for tanning extract having a general use in the industrial arts; since Feb. 2, '42.

451,787. The Tremco Manufacturing Co.; Cleveland, Ohio; Mar. 20, '42; for corrosion inhibiting coating liquids for metal surfaces; since Feb. 21, '42.

451,792. American Glossite Co., Inc.; New York, N. Y.; Mar. 21, '42; for glossy coating for paper products; since Jan. 2, '42.

451,795. Carter Products, Inc.; New York, N. Y.; Mar. 21, '42; for anti-perspirant and perspiration deodorant; since Mar. 10, '42.

451,804. Eastman Kodak Co.; Jersey City, N. J., and Rochester, N. Y.; Mar. 21, '42; for organic chemicals; since Dec. 24, '41.

451,832. W. H., and L. D. Betz; Philadelphia, Pa.; Mar. 23, '42; for preparation used to inhibit deposits of scale in cooling water and boiler water systems; since Mar. 1, '41.

451,847. Parke, Davis & Co.; Detroit, Mich.; Mar. 23, '42; for preparations containing cardioactive constituents of digitalis for use in treatment of cardiovascular disturbances; since Mar. 11, '25.

451,848. Parke, Davis & Co.; Detroit, Mich.; Mar. 23, '42; for preparations containing progestin for treatment of certain endocrine deficiencies; since Jan. 4, '28.

451,849. Parke, Davis & Co., Detroit, Mich.; Mar. 23, '42; for preparations used in treatment of fungus and other infections; since June 25, '30.

451,850. Parke, Davis & Co., Detroit, Mich.; Mar. 23, '42; for preparations used for protection of the skin and for prevention and treatment of disturbances of skin surfaces; since Aug. 12, '36.

451,852. Parke, Davis & Co.; Detroit, Mich.; Mar. 23, '42; for medicinal preparations; since July 25, '31.

451,861. U. S. Process Corp.; New York, N. Y.; Mar. 23, '42; for chemical compound applied to textiles, leathers, fibres and fibrous articles as a fire resistant; since Sept., '41.

451,869. Hoffmann-La Roche, Inc.; Nutley, N. J.; Mar. 24, '42; for medicinal preparations; since Jan. 12, '42.

451,872. I. F. Laucks, Inc.; Seattle Wash.; Mar. 24, '42; for glues; since Mar. 4, '42.

451,890. Cooperative G.L.F. Soil Building Service, Inc.; Ithaca, N. Y.; Mar. 25, '42; for insecticides; since Jan. 2, '42.

451,922. Wultex Products; Clara City, Minn.; Mar. 26, '42; for antiseptic for drinking water for poultry; since Nov., '34.

451,944. E. R. Squibb & Sons; New York, N. Y.; Mar. 27, '42; for antiseptic and analgesic preparations; since Mar. 20, '42.

451,974. Fred Herman & Sons; Chicago, Ill.; Mar. 24, '42; for sodium hypochloride disinfectant; since Feb. 15, '42.

451,997. American Tar Co.; Spokane and Seattle, Wash.; Mar. 30, '42; for copper oleate, coperlineum, specification creosote, commercial creosote oil, light creosote oil, benzol, toluole, and solvent naphtha; since Mar. 1, '22.

452,090. New England Collapsible Tube Co.; New London, Conn.; Apr. 1, '42; for special alloy collapsible tubes to be used as a substitute for tin tubes, caps for such collapsible tubes, and cans of collapsible tube-type of construction, the collapsible tubes and the cans of collapsible tube-type of construction being sold in the trade empty; since Dec. 1, '41.

War Regulations
Priorities, Allocations, Import and Price Controls—p. 27

Summary of War Regulations

There are no more important subjects to the chemical industry today than priorities, allocations, import and price controls. Chemical Industries, last month, chronologically digested the important regulations up to Feb. 28, 1942. This month new regulations are brought up to March 31, 1942. Next month and each month thereafter additional and revised regulations will be given.

By way of explanation a "P" order identifies a limited blanket rating given to a company, or an industry to facilitate the acquisition of scarce materials needed by such companies for defense or essential civilian production.

Distribution of commodities under industry-wide control generally is governed by "M" (material) orders, regulating distribution and flow of a given material into defense or essential civilian production channels.

Limits on the production of materials are covered by "L" limitation orders.

Rigid government controls for the war's duration over retail and wholesale prices and rents were announced by Price Administrator Leon Henderson on April 28.

In a single sweeping order—the General Maximum Price Regulation—the Administrator set the highest prices charged in March, 1942, as an absolute ceiling over virtually everything that Americans eat, wear, and use. The only exemptions are a limited list of food commodities. Companion orders paved the way for Federal control of rents in 302 defense areas in 46 States and Puerto Rico, housing more than 76,000,000 persons, and set separate ceilings for a broad range of commodities and products.

By its terms, the General Maximum Price Regulation requires that: (1) Beginning May 18, retail prices, with a few exceptions, must not exceed the highest levels which each individual seller charged during March 1942. (2) Beginning May 11, manufacturer and wholesale prices and the prices for wholesale and industrial services must not exceed the highest March levels for each seller. (3) Beginning July 1, no one may charge more for services sold at retail in connection with a commodity than he charged during March. (4) Effective *immediately*, all retailers, wholesalers, manufacturers and sellers of services must preserve existing records of sales made during March for maximum pricing purposes when the ceiling goes into effect.

"Highest price charged" means two things:

First it means the top price for which an article was delivered during March, 1942, in completion of a sale to a purchaser of the same class. Customary allowances, discounts or other price differentials cannot be changed, except to lower the price. Thus a physician who buys bandages or proprietary medicines from a local drugstore will, if he has a professional discount, continue to receive the benefit of a lower maximum price than an ordinary citizen. Second, if there was no actual delivery of a particular article during March, the seller may establish as his maximum price the highest price at which he offered the article for sale during that month. This permits the use of a list price if no completed sale occurred in March. Conversely however, if there was a completed sale at a price under the list price the actual sale price must be used as the maximum. The "offering price" where used to set the maximum price cannot be a "freak" price quoted to open bargaining or one never intended to apply to a bona fide sale.

Acrylonitrile

May 14, 1942. Placed under allocation control by General Preference Order M-153.

Aluminum

May 2, 1942. Amendment No. 1 to Order M-1-d re-defines scrap segregation. Sales up to 5000 lbs. per month permitted to approved purchaser.

May 5, 1942. Exemption No. 4 removes aluminum stocks in hands of wholesalers and distributors from restrictions of Suppliers' Inventory Limitation Order L-63.

May 14, 1942. Suspension orders S-55, S-56, S-57 issued against three companies accused of illegal dealings in aluminum.

Anti-Freeze

May 14, 1942. Order L-51 places antifreeze on quota basis.

Butyl Alcohol

May 28, 1942. General Preference Order M-159 places all grades of butyl alcohol under complete allocation control. Purchasers to apply for allocation on PD-505. Producers and distributors to apply on PD-506. Deliveries to persons using less than 54 gallons per month made without allocation providing total of these deliveries does not exceed 2% of producer's monthly output.

Calcium-Silicon

May 30, 1942. General Preference Order M-20-a extended indefinitely. No change was made in the order which was issued Nov. 29, 1941 and exercises complete allocation control.

Chemical Producers

May 22, 1942. Amendment No. 1 to General Preference Order P-89 allows the chemical producer to use an A-1-c rating to obtain 30% of his regular supplies, and an A-3 for the remaining 70%.

Chlorine

May 5, 1942. Amendment to General Preference Order M-19 curtails use of chlorine in a number of applications.

May 15, 1942. Paper and Pulp Branch of WPB announced chlorine shortage and asked bleached pulp producers to make allowances in preparing schedules of tonnages to be bleached each month in connection with Order M-93.

Chromium

May 27, 1942. Conservation Order L-134 regulates use of chromium in many types of instruments, regulators and control valves.

Citric Acid

May 25, 1942. Price Schedule No. 101 revised.

Copper

May 6, 1942. Limitation Order L-106 bans use of copper and copper base alloys in all but essential operating parts of motor vehicles.

May 7, 1942. Copper and its alloys banned from 100 civilian products.

May 14, 1942. Suppliers' Preference Rating Order No. P-106 amended to grant A-1-c to suppliers of maintenance and repair parts to copper and brass mills, to enable replenishment of inventories when they have filled orders of A-1-c or higher.

Cotton

May 28, 1942. Conservation Order M-157 places chemical cotton pulp under full allocation control, effective July 1.

Dyestuffs

May 11, 1942. To stretch supplies of dyestuffs the Bureau of Industrial Conservation has requested manufacturers to cease manufacturing and selling col-

War Regulations
Priorities, Allocations, Import and Price Controls—p. 27

War Regulations
Priorities, Allocations, Import and Price Controls—p. 28

ored sheets, colored sheeting and sheets with colored edges by July 1.

May 26, 1942. Dyestuffs conservation Order M-103 amended to increase the quantity of dyes available for civilian uses.

Fats and Oils

May 6, 1942. Cottonseed oil placed under ceilings for various grades.

May 11, 1942. Because they are fat or oil bearing material rather than raw fats, butcher shop fats and suet, slaughterhouse fats and suet, offal collected at butcher shops and slaughterhouses, poultry offal, bones, fallen animals, and greases collected from hotels and restaurants are not covered by Revised Price Schedule No. 53 but are covered by the General Maximum Price Regulation and Supplemental Regulation No. 1.

May 11, 1942. Amendment 1 to Conservation Order M-60 to restrict use of high lauric acid oils, including coconut, babassu, and palm kernel oils in food products in June and July to 50% and in August and September to 25% of amounts used in same months of 1941.

May 14, 1942. Amendment to Order M-66 prohibits use of cashew nut shell oil in manufacture of brake linings except for the Army and Navy.

Insecticides

May 18, 1942. OPA declares retail sales of agricultural insecticides and fungicides to be seasonal and issued Maximum Price Regulation No. 144 to determine manner in which maximum retail prices are to be established.

May 18, 1942. OPA adds household insecticides to restricted list of summer seasonal goods on which retailers may establish ceiling prices through methods provided by Maximum Price Regulation No. 142.

Kapok

May 5, 1942. Amendment 2 to General Conservation Order M-85 extends ban on kapok.

Kyanite

May 6, 1942. Indian kyanite (including andalusite and sillimanite), a refractory used in furnaces was placed under complete allocation control by Order M-143.

Lead

May 6, 1942. Lead pool for May set at 15% of March production.

Lithopone

May 6, 1942. Order M-128 places zinc sulfide pigments in a monthly producers' pool.

Manganese

May 4, 1942. Metal Reserve Co. issues price schedule for domestic ore purchases.

Molasses

May 2, 1942. Three Puerto Rican rum distillers penalized for disregard of General Preference Order No. 54, prohibiting distillation of rum from molasses.

May 11, 1942. Amendment No. 1 to General Preference Order M-54 removes certain restrictions. Molasses deliveries may be made to primary as well as secondary distributors of molasses for resale. All such deliveries are subject to allocation, re-distribution, or re-delivery by Director of Industry Operations.

May 25, 1942. Amendment No. 2 to Order M-54 permits distributors of molasses to farmers for insecticidal purposes to acquire stocks equal to their purchases in a corresponding quarter for the year ending June 30, 1941.

Naphthalene

May 6, 1942. Conservation Order M-105 issued by WPB placing naphthalene under rigid allocation control, effective June 1. After that date, except for certain exempted types of delivery, all naphthalene shipped by a producer or distributor must be delivered in accordance with schedules to be issued by Director of Industry Operations at beginning of each calendar month.

Naphthenates

May 5, 1942. Order M-142 places naphthenates and naphthenic acid under allocation control.

Nickel

May 1, 1942. Amendment No. 2 excepts metallic nickel purchases made by the Metals Reserve Co. of stocks frozen by the Nickel Conservation Order M-6-b from the provisions of Nickel Scrap Price Schedule No. 8.

May 9, 1942. Suspension order S-52 issued against Superior Metal Co. of Chicago, Ill, barring all dealings in any type of nickel for two months. Order issued on basis that company misrepresented applications for priority assistance.

May 14, 1942. Amendment No. 3 to Price Schedule No. 8 licenses scrap dealers and users and sets forth enforcement provisions.

Petroleum Solvents

May 25, 1942. Order M-150, effective May 25 issued to limit use of aromatic petroleum solvents. Deliveries may be made only to fill orders of high priority rating. During period June 4 to June 14, required rating is A-10; beginning June 15, required rating is A-2. A person purchasing solvents for resale without physical or chemical change is not required to show a rated use.

Phosphate Rock

May 11, 1942. Inventory restrictions removed to permit consumers to take advantage of transportation facilities when available.

Solvents

May 2, 1942. Amendment to Conservation Order M-41 changes preference ratings for all permitted uses of chlorinated hydrocarbon solvents.

Tantalum

May 22, 1942. Order M-156 places entire output of tantalum under allocation control. Prospective purchasers must file, by 20th of each month, a report on Form PD-488 and an application on Form PD-487. To receive allocations for June, user must file reports by June 1. Processors of tantalum ore must report by June 27, and the 27th of each succeeding month, on Form PD-489.

Zinc

May 1, 1942. Metallic zinc will be placed under complete allocation control beginning June 1. Amendment to M-11 sets metallic zinc pool at 75% of January production for high grade and special grade, and 50% for all other grades. Zinc oxide pool set at 10%.

May 6, 1942. Order M-128 places zinc sulfide pigments in a monthly producers' pool.

U. S. Chemical Patents
Off. Gaz.—Vol. 536, Nos. 2, 3, 4—p. 342

A Complete Check—List of Products, Chemicals, Process Industries

Cellulose

Solution in a volatile organic solvent of a cellulose ester and plasticizer, adapted to be cast on a casting surface to form transparent sheeting containing as a substance for facilitating stripping of sheeting from the casting surface from 0.05% to 5% of a dialkyl ester of sulfosuccinic acid. No. 2,275,716. Gustave B. Bachman and Carl N. Behrndt to Eastman Kodak Co.

Method producing uniformly substituted solvent-soluble lower alkyl ethers of cellulose. No. 2,276,460. Edgar C. Britton and Walter J. LeFevre to The Dow Chemical Co.

Acid and alkali resistant cellulose ester coating composition. No. 2,276,874. Harold C. Reynolds, Jr. and Henry B. Kellogg to Standard Oil Development Co.

Ceramics, Refractories

Process of vitreous enamel coating. No. 2,277,005. Carl R. Ruse to Plastic Lights, Inc.

Chemical Specialty

Method of high speed printing which comprises applying to surface a press-stable printing ink comprising a solution of a binder in a solvent substantially non-volatile at ordinary press room temperatures, thereafter applying to the printed surface a combustible liquid volatile at room temperatures, and passing the printed surface through a combustion chamber containing an open flame whereby the added liquid immediately ignites and the liquid and ink solvent are vaporized and the vapors burned. No. 2,275,521. Albert E. Gessler to Interchemical Corp.

In method preventing offsetting of printed material, the step of spraying same with an aqueous solution containing polyvinyl alcohol. No. 2,275,578. Wm. H. Wood to Harris-Seybold-Potter Co.

Formaldehyde-urea adhesive. No. 2,275,821. Arthur M. Howald and Kenneth D. Meiser to Plaskon Co.

Method fabricating hydraulic cement sheets comprising molding a sheet of hydraulic cement with an absorbent resilient sheet and a woven fabric interposed between the cement and the mold, said absorbent resilient sheet being between the woven fabric and the mold. No. 2,276,083. William J. Moeller to The Philip Carey Manufacturing Company.

Stable jelly-like soap composition comprising the reaction mixture of at least 80% whole milk having present at least about 3½% of butter fat, an ethanolamine soap of a fatty acid, hydrogenated cocoanut oil, a lower alkyl glycol, and boric acid, the latter three ingredients being present in an amount less than the ethanolamine soap. No. 2,276,409. John McCormick to Edward J. McLaughlin.

Composition suitable for lubricating die members used in compressing finely divided particles of material into composite bodies, comprising 20 to 30 parts stearic acid, 4 to 6 parts spermaceti, 4 to 6 parts lanolin, 1 to 3 parts borax, and a sufficient quantity of water to form a homogeneous emulsion of said ingredients. No. 2,276,453. Adolph F. Bandur to Western Electric Co., Inc.

Extreme pressure lubricant comprising lubricating oil containing a minor percentage of amyl benzene dichlor phosphine. No. 2,276,492. Samuel E. Jolly and John H. Perrine to Sun Oil Co.

Insecticidal compositions comprising at least one member of class consisting of N: N'-di (1-cyanoalkyl)-substituted aliphatic and heterocyclic diamines and an inert carrier. No. 2,277,158. Wilfred A. Sexton to Imperial Chemical Industries, Ltd.

Coal Tar Chemicals

Method preparing ester of polycarboxylic acid which comprises reacting salt of an unsaturated partial ester of a polycarboxylic acid with an unsaturated halide which contains a halogen atom attached to a saturated carbon atom whereby an unsaturated ester is formed. No. 2,275,467. Maxwell A. Pollack and Albert G. Chenicek to Pittsburgh Plate Glass Co.

Tri-hydroxymethyl-acetaldehyde of the following formula: $(HO.H_2C)_3$, $=C\text{-}CHO$, said compound being a limpid viscous liquid miscible with water. No. 2,275,586. Wilhelm Fitzky to General Aniline & Film Corp.

1, 4-Naphthoquinone compounds and material colored therewith. No. 2,275,741. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.

Process for manufacture of cyclic condensation products comprising condensing compounds which contain a system of conjugated multiple carbon linkages with a member of the group consisting of 1:2-diacyl-ethylenes and 1:2-diacyl-acetylene. No. 2,275,752. Moses W. Goldberg to Ciba Pharmaceutical Products, Inc.

Aldehydes of saturated and unsaturated pregnane-series and process of making same. No. 2,275,790. Karl Miescher and Werner Fischer and Albert Wettstein to Ciba Pharmaceutical Products, Inc.

Process for making 1-cyano-1, 3-butadiene. No. 2,276,156. Albert S. Carter and Frank W. Johnson to E. I. du Pont de Nemours & Co.

Aldehydes of saturated and unsaturated pregnane series. No. 2,276,543. Karl Miescher, Werner Fischer, Caesar Scholz and Albert Wettstein to Ciba Pharmaceutical Prods. Inc.

Oxidation products of cyclopentano-polyhydrophenanthrene series and process of making same. No. 2,276,547. Leopold Ruzicka to Ciba Pharmaceutical Products, Inc.

N-phenylaliphatic dihydroxyphenyl-aliphatic amines. No. 2,276,618 and 2,276,619. Fritz Kulz to Tropon-Werke Dinklage & Co.

5, 6, 7, 8-tetrahydroanthraquinone derivatives containing nitrogen and a process of preparing them. No. 2,276,637. Karl Zahn and Heinrich Koch to General Aniline & Film Corp.

Manufacture of 4-aminobenzene-sulfonamide. No. 2,276,664. Fritz Mietzsch, Robert Behnisch and Josef Klarer to Winthrop Chemical Co., Inc.

Coal Tar Chemicals

Sulfonyl halides. No. 2,277,325. Richard Hueter, Haus Waldfrieden to "Unichem" Chemikalien Handels A.-G.

Process for the manufacture of tetrapyridylphthalocyanines comprising bringing, tetradiazotised tetra-amino-phthalocyanines into reaction contact with pyridine. No. 2,277,588. Norman Haddock to Imperial Chemical Industries Ltd.

Process for manufacture of new phthalocyanine pyridinium salts which comprises causing pyridylphthalocyanines to interact with quaternising agents. No. 2,277,628. Eric Bradbrook, Samuel Coffey and Norman Haddock to Imperial Chemical Industries Ltd.

Process for manufacture of new phthalocyanines nuclearly substituted by pyridyl groups, comprising interacting pyridylphthalonitriles with metal-yielding substances. No. 2,277,629. Eric Bradbrook, Isidor Heilbron and Donald Hey and John Haworth to Imperial Chemical Industries Ltd.

Coatings

Compositions suitable for use in coatings drying substantially by evaporation. No. 2,275,583. Wm. R. Catlow, Jr. and Harold F. Wakefield to Bakelite Corp.

Composition suitable for use in coating compositions drying substantially by evaporation. No. 2,275,584. Wm. R. Catlow, Jr. and Harold W. Wakefield to Bakelite Corp.

Method of producing protective coatings of improved corrosion resistance on articles of magnesium or magnesium base alloys. No. 2,276,286. Robert W. Buzzard.

Alkali resistant coating. No. 2,276,519. Joseph L. Sherk and Corliss F. Cummins to The Dow Chemical Co.

Dyes, Stains

Reissue. **Azo dyestuffs** containing a heavy metal in complex form. No. 22,046. Ernst Fellmer to General Aniline & Film Corp.

Polyazo dyestuffs and process for their manufacture. No. 2.276,169. Fritz Dobler and Hans Buess to J. R. Geigy A. G.

Azo dyestuffs. No. 2,276,174. Richard Fleischhauer and Adolf Muller to General Aniline & Film Corp.

Process improving an acid pasted copper phthalocyanine pigment which comprises subjecting said acid pasted pigment to a mild oxidation treatment with a dilute aqueous solution of an inorganic oxidizing agent under non-acid conditions. No. 2,276,175. Maurice H. Fleysher and James Ogilvie to Allied Chemical & Dye Corp.

Acyl Derivatives of Azo Dyestuffs, and Process of Preparing same. No. 2,276,187. Charles Graenacher, Franz Ackermann, Heinrich Bruengger to Society of Chemical Industry in Basle.

Stilbene dyestuffs and their manufacture. No. 2,276,202. Ernst Keller to J. R. Geigy, A. G.

Process of dyeing and the products thus obtained. No. 2,276,602. Jurgen von Klenck and Josef Nusslein to General Aniline & Film Corp.

Coloring matter of phthalocyanine series containing more than 8 halogen atoms per molecule and being substantially identical with the compound obtained by subjecting a coloring matter of the phthalocyanine series to halogenation by the aid of a halogenating agent selected from the group consisting of chlorinating agents and brominating agents. No. 2,276,860. Georg Niemann, Willi Schmidt, Fritz Muehlbauer and Georg Wiest to General Aniline & Film Corp.

Dyestuffs of the phthalocyanine series. No. 2,276,918. Berthold Bienert and Hermann Thielert to General Aniline & Film Corp.

Color lake comprising the water-insoluble metal salts, precipitated in presence of water-soluble dyestuff, of a mixture of acids derived from asphaltic still bottoms obtained in the distillation of petroleum said acids including ones having the generic formula $C_nH_{2n-10}O_2$. No. 2,277,194. Gellert Alleman and John H. Perrine to Sun Oil Co.

Azo dyestuffs. No. 2,277,230. Ernst Heinrich to General Aniline & Film Corp.

Watersoluble azo dyestuffs. No. 2,277,243. Gottfried Manz to General Aniline & Film Corp.

Asymmetric azo dyestuffs. No. 2,277,262. Eberhard Stein, Carl Taube and Siegfried Petersen to General Aniline & Film Corp.

Process producing fast dyeings on vulcanized fiber which comprises applying to the finished vulcanized fiber leuco-esters of vat dyestuffs and producing the vat dyestuff in and on the fiber by splitting off the ester groups and oxidizing. No. 2,277,527. Josef Nusslein and Werner Kirst to General Aniline & Film Corp.

Process of producing fast dyeings and the dyed fiber obtained thereby. No. 2,277,544. Erich Fischer and Walter Gmelin and Werner Kirst to General Aniline & Film Corp.

Process of producing fast dyeings and the dyed fiber obtained thereby. No. 2,277,551. Werner Kirst and Erich Fischer to General Aniline & Film Corp.

Equipment, Apparatus

Steam pressure vessel resistant to caustic cracking. No. 2,275,464. Norman B. Pilling and Frederick G. Straub to The International Nickel Co., Inc.

Catalytic reactor. No. 2,275,920. Harry L. Pelzer and Willis S. Gullette to Sinclair Refining Co.

Acetylene generator. No. 2,275,990. Ralph C. Pierson to Oxweld Acetylene Co.

Exothermic catalytic reactions. Process and apparatus therefor. No. 2,276,229. James K. Dixon to American Cyanamid Co.

Solid and liquid contact apparatus. No. 2,276,298. Charles H. Frazier to The Drackett Co.

Apparatus comprising a reaction chamber having means for setting a liquid therein in rotary agitative motion, an upwardly expanding clarification chamber having a lower main communication with

U. S. Chemical Patents
Off. Gaz.—Vol. 536, Nos. 2, 3, 4—p. 342

U. S. Chemical Patents

Off. Gaz.—Vol. 536, Nos. 2, 3, 4—p. 343

said reaction chamber, diverse downwardly extending conduits extending from above said main communication to said reaction chamber, and means for withdrawing liquid from said clarification chamber above said conduits. No. 2,276,300. Walter H. Green to International Filter Co.

Catalytic converter. No. 2,276,307. Eugene J. Houdry to Houdry Process Corp.

Fluid heat exchange apparatus. No. 2,276,326. Marten Martensson to The Babcock & Wilcox Co.

Catalytic reactor. No. 2,276,340. Thomas Prickett and Clarence Thayer to Houdry Process Corp.

Catalytic reactor. No. 2,276,356. Robert Velykis to Houdry Process Corp.

Apparatus for removing salts of carbonic acid from water containing same. No. 2,276,560. Paul G. Bird to National Aluminate Corp.

Apparatus for recovery of liquids from solids. No. 2,277,053. Henry L. Alexander, Hubert I. Du and Willing B. Foulke to Delaware Chemical Engineering & Develop. Co.

Apparatus for control of hydrocarbons. No. 2,277,075. Edward T. Dahl to Mason-Neilan Regulator Co.

Fluid mixing apparatus. No. 2,277,314. James W. Gallagher to Arthur W. Schiefer.

Evaporative condenser. No. 2,277,320. Ernest Gygax to Curtis Mfg. Co.

Tray for use in a chemical reaction furnace and the like, comprising a hollow lower portion, a rimmed upper portion, adjacent inlet and outlet ports to said hollow portion, and an enclosed radically disposed passageway through such tray between said ports, the walls of said passageway forming a baffle wall between said ports. No. 2,277,355. Howard Roderick and Arthur C. Schubring to Michigan Alkali Co.

Method and apparatus for direct steam treatment of extracted solid materials. No. 2,277,361. Michele Bonotto to Extractol Process Ltd.

Deaerating apparatus. No. 2,277,368. Victor Rohlin to Cochrane Corp.

Apparatus for quick freezing food products. No. 2,277,382. Otto Botz.

Abrading tool having a portion thereof consisting of diamond particles distributed in a matrix which consists of a cemented carbide containing an appreciable quantity and up to about 8% silver. No. 2,277,428. Edgar Engle to Carboloy Co. Inc.

Explosives

Method increasing density of charge of amatol in which percentage of TNT is less than required to make amatol a flowing liquid at temperature within 10 or 20 degrees above melting point of TNT; which comprises compressing a minor portion of the amatol into pieces of density in excess of 1.50 at pressure from 5 to 30,000 pounds per square inch, mixing such pieces with major portion of the uncompressed amatol at a temperature well above 80.2°C., and charging the mixture while still hot into the cavity to be filled. No. 2,275,569. Walter O. Snelling to Trojan Powder Co.

Fine Chemicals

Sulfuric derivatives of ethers. No. 2,275,413. Heinrich Bertsch to American Hyalsol Corp.

Process obtaining relatively pure aluminum bromide from an aluminum bromide-containing sludge arising from the use of aluminum bromide as catalyst in hydrocarbon conversion reactions. No. 2,275,465. Herman Pines to Universal Oil Products Company.

Stable medicinal preparation comprising a solution of a non-toxic basic amino acid salt of a bile pigment. No. 2,275,623. Edwin L. Gustus to Wilson & Co., Inc.

Photographic silver halide emulsion sensitized with a cationic surface active sulfonium salt. No. 2,275,727. Burt H. Carroll and Charles F. H. Allen to Eastman Kodak Co.

Method producing mammalian liver derivative containing an antimenorrhagic fraction, which comprises subjecting mammalian livers to extraction to produce a solution of saponifiable and unsaponifiable fat-soluble substances, subjecting the solution to hot saponifiable residue, and subjecting the unsaponifiable residue to a crystallation step to remove cholesterol. No. 2,275,784. Siegfried Maurer and Harold O. Wiles to Armour & Co.

Reaction of epinephrine with amino acids and products thereof. No. 2,275,809. Richard G. Roberts.

Transparent photographic element comprising a support, a sensitive emulsion layer thereon, and a layer of a dicarboxylic acid ester of gum arabic thereon. No. 2,275,817. Charles R. Fordyce and John Emerson to Eastman Kodak Co.

Extraction of theobromine. No. 2,275,835. Clemens A. Balmert and Russell D. Drinkard and Guy N. Harcourt to Citro Chemical Co. of Amer.

Sodium perborate preparation. No. 2,275,979. Nicholas M. Molnar.

Aliphatic sulfonyl fluorides and their preparation. No. 2,276,097. Paul L. Salzberg to E. I. du Pont de Nemours & Company.

Preparation of polythioamides from thiolactams. No. 2,276,164. Norman L. Cox and William E. Hanford to E. I. du Pont de Nemours & Co.

Condensation of allyl halides and substituted allyl halides. No. 2,276,203. Morris Selig Kharasch to E. I. du Pont de Nemours & Co.

Aqueous medical preparation comprising a tannin extract of the catechol group and boric acid as an acidifying agent in an amount sufficient to impart to the preparation a pH materially lower than the pH of the natural aqueous solution of the catechol tannin, whereby the preparation is stable and does not precipitate over relatively long periods, the tannin content of the preparation being above 2% and below about 10%. No. 2,276,241. Elbert M. Shelton to The Tannin Corp.

Iodized calcium carbonate. No. 2,276,503. Brack B. McHan to Calcium Carbonate Co.

Method for separation of optically active α-methylphenethylamine. No. 2,276,508 and 2,276,509. Fred P. Nabenhauer to Smith, Kline & French Labs.

Water-dispersible vitamin composition. No. 2,276,531. Ralph Wechsler and Bernard A. Dombrow to National Oil Products.

Thiocarbonates and imino-thiocarbonates of aromatic polyhydroxy compounds. No. 2,276,553. Georg Werner to Winthrop Chemical Co., Inc.

Silver halide emulsion containing a dyestuff component for color-forming development of the α-naphthol series. No. 2,276,554. Gustav Wilmanns, Kreis Bitterfeld and Oskar Riester to General Aniline & Film Corp.

Process forming a specific methyl glycoside, which comprises effecting a methyl glucoside reaction between a carbohydrate which will hydrolize to glucose and methanol in contact with a mineral acid catalyst and a methyl glucoside product deficient in said specific methyl glycoside and cooling to product crystallization. No. 2,276,621. David P. Langlois to A. E. Staley Mfg. Co.

Therapeutically active, solid, uniform and stable preparation for treatment of affections of central nervous system, comprising alkaloids hyoscyamine, atropine and scopolamine in assimilable stable form in such ratio that hyoscyamine content of said preparation amounts to from 75.5 to 95.0%, the atropine content to from 20.0 to 1.5% and the scopolamine content to from 5.0 to 0.5% of the total alkaloid content of said preparation. No. 2,276,677. Hermann Vollmer to Sharp & Dohme, Inc.

Process for treatment of natural gastric mucin, which comprises treating natural gastric mucin with an excess of ammonia to produce a solution containing not less than 0.5% of ammonia, separating the thus formed precipitate from the liquid and evaporating the liquid to dryness. No. 2,276,882. Herman J. Schneiderwirth.

An anesthetic preparation comprising essentially procaine borate and as an agent for increasing the stability thereof, at least one acid-reacting acid anesthetic salt of a polybasic acid. No. 2,277,038. David Curtis.

Alkylene diamine alkyl mercury compounds. No. 2,277,180. Fritz Wolff, Iarl Gornitz and Willy Harnack to Sherka Chemical Co., Inc.

A light-sensitive layer for diazo-type printing. No. 2,277,408. Humphrey Murray to Norton & Gregory Ltd.

Industrial Chemicals

Method removing an allyl halide from a mixture containing an allyl halide containing halogen linked to a saturated carbon atom and a vinyl halide containing halogen linked to an unsaturated carbon atom. No. 2,275,466. Maxwell A. Pollack and Albert G. Chenicek to Pittsburgh Plate Glass Co.

Mixed aryl hydroxyalkyl amines. Method of making. No. 2,275,470. Robert G. Ruark to Carbide and Carbon Chemicals Corp.

Reaction product consisting of polymerized polyhydric alcohol of molecular weight in excess of 500 and completely esterified with an organic acid containing more than 5 carbon atoms to the molecule, said product being soluble in water to provide a clear water solution thereof. No. 2,275,494. Harry Bennett.

In process of dry cleaning step which comprises contacting a fibrous article undergoing cleaning treatment with dispersion of solid N-chloro organic compound in liquid aliphatic chloride of low boiling point to clean the fibrous material and to impregnate the article with the dispersion of N-chloro compound and expelling the solvent from the impregnated article to produce a cleaned article containing a quantity of said N-chloro compound in the interstices thereof. No. 2,275,593. Irving E. Muskat and Albert G. Chenicek to Pittsburgh Plate Glass Co.

A liquid adapted to be rubbed on a surface to be polished comprising a 3 phase emulsion of a petroleum hydrocarbon lubricating medium as a discontinuous phase, a polishing base medium as a discontinuous phase, and water as a continuous phase, said polishing base consisting substantially entirely of at least one compound of the group consisting of monoglycerides and diglycerides of fatty acids, said compound being substantially immiscible with said lubricating medium and with said water. No. 2,275,596. Leroy W. Shuger to Baltimore Paint & Color Works, Inc.

Terpene-cyanoacyl compounds and methods of producing same. No. 2,275,606. Joseph N. Borglin to Hercules Powder Co.

In manufacture of wax from crude vegetable wax powder which has not been melted in production thereof, the process which comprises screening the said crude vegetable wax powder through one or more screens of about 40 to 60 mesh prior to its initial melting to remove fine leafy and other non-waxy material. No. 2,275,630. Herbert F. Johnson, Jr. and John V. Steinle and Robert P. Gardiner to S. C. Johnson & Son, Inc.

In method of fermenting a fermentable carbohydrate mash containing alkaline salts to glycerin, the steps comprising fermenting the mash subjecting the fermented mash to vacuum distillation at temperatures substantially below the boiling point of alcohol to distill off the alcohol formed during fermentation adding fresh fermentable material to the residue and refermenting it. No. 2,275,639. Nathan M. Mnookin to Speas Development Co.

Water-removable wax coating. No. 2,275,659. John V. Steinle and Anton E. Budner to S. C. Johnson & Son.

In manufacture of wax from crude vegetable wax powder which has not been melted in production thereof the method which comprises adding to said crude vegetable wax powder a solid adsorbent adapted to adsorb chlorophyl and like coloring matter heating resulting mixture until wax therein becomes molten and filtering the molten mass. No. 2,275,660. John V. Steinle and Elbert S. McLoud to S. C. Johnson & Son, Inc.

In manufacture of wax from crude vegetable wax powder which has not been melted in production thereof the method which comprises adding a hot solvent for wax to said wax powder immediately thereafter passing the dissolved wax and solvent through a filter adapted for rapid filtration, and removing the solvent in the filtrate to recover the dissolved wax. No. 2,275,661. John V. Steinle and Elbert S. McLoud to S. C. Johnson & Son, Inc.

Mixed polyvinyl esters containing dicarboxylic acid groups. No. 2,275,685. Martti Salo to Eastman Kodak Co.

In production of caustic soda by causticization of soda ash with lime, the improvement which comprises maintaining a maximum concentration of sodium sulfate not substantially exceeding 0.0025% Na_2SO_4 on the sodium hydroxide present following causticization and subsequently precipitating and settling precipitated sodium carbonate and sodium sulfate from the causticized liquor while maintaining said maximum concentration of sodium sulfate. No. 2,275,792. Wm. C. Moseley to The Mathieson Alkali Works, Inc.

U. S. Chemical Patents

Off. Gaz.—Vol. 536, Nos. 2, 3, 4—p. 344

Improved process for azeotropic distillation of aqueous solutions containing at least one lower aliphatic acid. No. 2,275, . Donald F. Othmer and Robert E. White to Eastman Kodak Co.

In refining nitrated wood pulp made from thin pieces of wood pulp, step which comprises mixing 1-50% (based on the weight of mixture) of nitrated cotton therewith prior to at least one of the refining steps. No. 2,275,805. John L. Patterson to Eastman Kodak Co.

In process for manufacture of hydrochloric acid by reacting sodium chloride, sodium acid sulfate, sulfuric acid and steam, wherein residual materials containing sulfuric acid liquid and sodium sulfate are obtained, the steps of rendering at least some of residual constituent re-utilizable comprising crystallizing part of the sodium sulfate from sulfuric acid liquid and subjecting the sulfuric acid liquid to an evaporation treatment by heating the acid liquid for volatilizing off water to produce sodium acid sulfate therein for use in aforementioned reaction. No. 2,275,825. Warren K. Lewis to Eastman Kodak Co.

Process for converting starch containing material for subsequent yeast fermentation, comprising the step of converting starch containing material by addition of between about 1% and 7% of unmalted raw finely ground millet and between about 2% and 9% of ground malt. No. 2,275,836. Erich Briess.

Process forming condensation product which comprises reacting an acyclic olefinic acid having less than 10 carbon atoms in the carbon chain of an oil predominantly consisting of glycerides of linoleic and oleic acids at a temperature in excess of 150°C. and for a time of at least three-quarters of an hour. No. 2,275,843. Edwin T. Clocker.

Starch finishing and sizing composition and method of producing same. No. 2,275,845. Stoney Drake.

Extraction of lower aliphatic acids. No. 2,275,862. Donald F. Othmer to Tennessee Eastman Corp.

Method providing a cathode with coating of alkaline earth oxide which consists of applying thereto alkaline earth hydroxide and thereupon dissociating such hydroxide into oxide and water vapor in presence of hydrogen gas. No. 2,275,886. Ralph J. Bondley, Herman A. Liebhafsky and Arthur F. Winslow to General Electric Co.

Derivatives of furfural and method of making. No. 2,275,923. Henry L. Ross and Alfred W. C. Wroblewski.

Sterol-like preparation. No. 2,275,969. August J. H. Kongsted.

Process for production of butadiene which comprises leading a mixture of n-dichlor butane and vaporized hydrochloric acid or constant boiling point through a reaction vessel heated to temperatures exceeding 500°C. but below those at which substantial splitting of the carbon chain occurs. No. 2,276,023. Martin Mueller-Conradi, Adolf Cantzler and Hans Krekeler to Jasco, Inc.

In process for production of a chlorosulfonate the step comprising reacting a chloride with gaseous sulfur trioxide in presence of a minor amount of vapors of added hydrogen chloride and chlorosulfonic acid, the amount so added being not substantially less than five hundredths per cent of the volume of sulfur trioxide. No. 2,276,041. Ralph K. Iler to E. I. du Pont de Nemours & Co.

Friction element containing friction material, a bond, and agglomerates of graphite particles, each of said agglomerates containing a multiplicity of graphite particles bonded together by rubber prior to being mixed with friction material and bond, each of said agglomerates containing sufficient quantity of rubber to keep said agglomerates substantially intact and to bond said agglomerates to other ingredients in said friction element. No. 2,276,070. Ray E. Spokes to The American Brake Shoe & Foundry Co.

Cyclic process for producing chlorine and sodium sulfate by reacting sulfur trioxide and sodium chloride. No. 2,276,079. Aylmer H. Maude to Hooker Electrochemical Co.

Process for the recovery of a solvent from a solution containing a substantial proportion of said solvent and a mineral oil of a higher boiling range than the solvent. No. 2,276,089. Edward G. Ragatz to Union Oil Company.

Hydrolysis of products obtained by reacting saturated hydrocarbons with sulfur dioxide and chlorine. No. 2,276,090. Cortes F. Reed to Charles L. Horn.

Polymeric ester of an inorganic ortho acid of an element of the class consisting of boron and silicon with a primary alcohol having an open chain unsaturated linkage between the carbon next to the carbinol carbon and the carbon once removed therefrom. No. 2,276,094. Henry S. Rothrock to E. I. du Pont de Nemours & Company.

Substituted phenylphenols. No. 2,276,116. Fred Lowell Taylor and John E. Livak to The Dow Chemical Company.

Substituted Phenols. No. 2,276,117. Fred Lowell Taylor and John E. Livak to The Dow Chemical Company.

In process utilizing heat evolved during an exothermic reaction for carrying out an endothermic reaction by using a heat exchange medium, the improvement which comprises using a mixture of stannous chloride with an anhydrous metallic halide, said mixture melting below 1000°C. No. 2,276,120. Charles L. Thomas to Universal Oil Products Company.

Process reclaiming commercially valuable alcohols from alcohol containing aldehydes which consists of mixing sulfuric acid, zinc dust and nickel powder with said aldehydes, heating and refluxing the mixture while volatilizing a portion to carry off undesirable elements, and then distilling the balance of the mixture to obtain deodorized, commercially valuable alcohol. No. 2,276,142. Harry G. Atwood.

Aldehyde quaternary ammonium compounds. No. 2,276,149. Louis H. Bock and Alva L. Houk to Rohm & Haas Co.

Asphalt and process for producing same. No. 2,276,155. Donald E. Carr to Union Oil Co. of Calif.

Linear polymeric secondary amides of primary monoaminomonocarbothionic acids having a recurring structural unit—NH-R-CS—wherein R is a divalent hydrocarbon radical having a chain length of at least five and wherein the valence attached to nitrogen stems from aliphatic carbon. No. 2,276,160. Donald D. Coffman and Lucius Gilman to E. I. du Pont de Nemours & Co.

Process which comprises causing chlorine to act upon liquid methyl bromide with exposure to actinic light. No. 2,276,166. Karl Dachlauer and Hermann Petri to General Aniline & Film Corp.

Method treating a non-crystalline scale salt which comprises applying a film of a solution of the salt to a drum drier for hardening and self-scaling at a subsequent point, heating the drum drier and cleaning and applying a film of a bond-preventing substance to the drum before applying the salt and after the scaling point. No. 2,276,172. Henry V. Farr and John R. Ruhoff to Mallinckrodt Chemical Works.

An interpolymer of a preformed heat blended frosting drying oil-varnish gum varnish with a polymerizable ester of an alpha-methylene open-chain aliphatic monocarboxylic acid. No. 2,276,176. Robert Barnett Flint and Henry Shirley Rothrock to E. I. du Pont de Nemours & Company.

In process of catalytically hydrogenating formaldehyde the step of carrying out the hydrogenation at a pH in excess of six. No. 2,276,192. William E. Hanford and Richard S. Schreiber to E. I. du Pont de Nemours & Company.

Light filtering composition. No. 2,276,204. Lowell B. Kilgore to Kilgore Development Corporation.

Continuous process for purification of a strong polybasic inorganic acid solution from small percentages of carbonaceous non-filterable impurities present therein. No. 2,276,210. Carl D. Lane and Charles H. Duffy to Shell Development Co.

Deodorization and Refining of Tung Oil. No. 2,276,233. Louis A. Gruenwald and Malcolm John Reider Gruenwald.

Method of producing a fatty oil-acid modified phthalic glyceride resin which comprises reacting together at high temperatures phthalic anhydride, glycerine and a fatty oil-acid in the presence of melamine in amounts of about 1 part of melamine for each 20 parts of phthalic anhydride. No. 2,276,243. Herbert J. West to American Cyanamid Corp.

Manufacture of Magnesium Products from Brines. No. 2,276,245. Robert E. Clarke to Marine Magnesium Products Corporation.

Emulsifying and foaming agents and process of producing them. No. 2,276,316. Henry Kraybill, Pearl Brewer and Max Thornton to Purdue Research Foundation.

Phosphatides-rich material substantially oil-free and at ordinary temperatures a very viscous liquid, derived from soy-bean oil, substantially completely soluble in ether and in anhydrous alcohol and in acetone, and substantially insoluble in dilute alcohol. No. 2,276,317. Henry Kraybill, Pearl Brewer and Max Thornton to Purdue Research Foundation.

Continuous process of making from lignite a gaseous mixture rich in hydrogen. No. 2,276,343. Lloyd Reyerson and Donald Gernes to Regents of the University of Minnesota.

Dielectric comprising a cellulose derivative of the class consisting of ethyl cellulose and benzyl cellulose and dimer of di-hydronaphthalene. No. 2,276,346. Samuel Ruben.

Method forming a water-resistant bond between a siliceous material and a bituminous material comprising incorporating in the bituminous material a small amount of a halide of a metalloid of the fifth group of the periodic system. No. 2,276,436. Elton Tucker and Henry Grubb to Standard Oil Co.

In process treating saponified tall oil of the type in which the unsaturated fatty portion has been saturated by hydrogenation, the step which comprises chilling a solution of such saponified hydrogenated tall oil in an organic solvent therefor to effect precipitation of fatty acid soaps. No. 2,276,517. Ernst Segessemann to National Oil Products Co.

Trimethylolnitromethane, method of purification. No. 2,276,564. Richard F. B. Cox to Hercules Powder Co.

Process for manufacture of water-soluble high molecular α-substituted aralkylamines. No. 2,276,587. Carl Mettler, Henry Martin and Alfred Staub to J. R. Geigy.

Manufacture of glycol ethers which comprises interacting an alkylene oxide with an organic compound containing at least one hydroxyl, **radical, said compound being selected from the** group consisting of alcohols and phenols, in the presence of a small amount of hexamethylene tetramine. No. 2,276,597. Herbert M. Stanley and Philip Eaglesfield to The Distillers Co. Ltd.

Manufacture of heavy metal compounds of phthalocyanines by heating cyclic ortho-dinitriles with compounds yielding heavy metal in the presence of indifferent liquid organic diluents, comprising adding to the mixture small proportions of compounds selected from group consisting of sodium hydroxide, calcium oxide and sodium carbonate as promoters of the reaction. No. 2,276,598. Robert Stocker and Armin Bucher to Society of Chemical Industry in Basle.

Process of preparing α-chloro-β-alkoxy butyraldehyde which comprises causing a lower saturated aliphatic primary alcohol to act upon chloro-crotonic aldehyde in a solution of an alkaline compound of an alkali metal at a temperature lower than about +10° C. No. 2,276,666. Walter Ostrowski and Otto Nicodemus to General Aniline & Film Corp.

Catalyst for the synthesis of ammonia. No. 2,276,679. Giles W. Abbott to The Dow Chemical Co.

In method making a solid porous catalyst which is capable of promoting reaction between hydrogen and nitrogen to form ammonia the steps which consist in mixing finely divided metallic iron with a suitable promoter therefor, compacting the mixture, and treating the compacted mixture with superheated steam at a reaction temperature above 500° C. to oxidize at least 85% of the iron and form a solid porous composition comprising ferro-so-ferric oxide. No. 2,276,693. Sheldon B. Heath to The Dow Chemical Co.

In manufacture of alkyl derivatives of urea, the process comprising reacting carbon dioxide with an alkyl amine by heating a mixture thereof under super-atmospheric pressure to a temperature between 100° C. and 250° C. No. 2,276,696. John F. Olin to Sharples Chemicals, Inc.

Manufacture of yeast and other like micro-organisms. No. 2,276,710. William G. Bennett to Standard Brands Inc.

Oxidizing hydrocarbons. No. 2,276,774. Clyde O. Henke and Roland G. Brenner to E. I. du Pont de Nemours & Co.

Process for regeneration of catalysts. No. 2,276,921. Ralph L. Brown to The Solvay Process Co.

Purification of cyclopropane. No. 2,276,922. Morton A. Buchman and Amos G. Horney to Air Reduction Co., Inc.

Method preparing a cyclo-hexyl-amino diphenylamine which comprises catalytically reducing an N, N'-diphenyl phenylene diamine with hydrogen gas. No. 2,276,957. Willis A. Gibbons and Frederick M. Lewis to United States Rubber Co.

Manufacture of thin boiling starches. No. 2,276,984. Hans O. Kauffmann, Paul H. Margulies and Joseph R. Ryan to Buffalo Electro-chemical Co., Inc.

Method separation of ore materials by differential settling which comprises subjecting an aqueous suspension containing slimy and coarser ore materials including gangue slime to differential settling in the presence of a coloring matter included in group consisting of sulfonated Nigrosine, Sap Brown, sulfonated betanaphthol

U. S. Chemical Patents
Off. Gaz.—Vol. 536, Nos. 2, 3, 4—p. 344

U. S. Chemical Patents

Off. Gaz. —Vol. 536, Nos. 2, 3, 4—p. 345

still tars and Sun Yellow. No. 2,277,010. Robert B. Booth to American Cyanamid Co.

Method for preparing an organic compound for use as a detergent, comprising adding diethanolamine and diethylene glycol to methyl alpha bromo myristate and heating the mixture at about 180 to 200° C. for about 60 to 90 minutes while stirring and refluxing the solvent, removing the solvent and adding potassium hydroxide dissolved in ethyl alcohol, filtering the mixture to remove potassium bromide, and distilling to remove the alcohol. No. 2,277,015. Herbert H. Guest to J. B. Williams Co.

Method producing an organic compound comprising reacting an alkylol amine, having at least 1 hydrogen atom connected to the nitrogen of the amino group, with a halogenated aliphatic compound, in which the halogen is connected to a carbon of the aliphatic compound not more than 7 carbon atoms distant from the alpha position, of the class consisting of monocarboxylic acids, esters and alkylol amides of the halogenated aliphatic compound, to replace the halogen with the alkylol amine. No. 2,277,016. Herbert H. Guest to The J. B. Williams Co.

Method for executing catalyzed vapor phase reactions. No. 2,277,022. Frank M. McMillan and George S. Parsons to Shell Development Co.

Alkyl ester of 9-cyano-nonanoic acid. No. 2,277,033. Wm. S. Bishop to Bell Telephone Labs., Inc.

Process of treating compositions containing mercurous sulfate and sulfuric acid which comprises separating the mercurous sulfate from the composition, converting sulfuric acid in the composition into persulfuric acid and treating mercurous sulfate originally separated with the persulfuric acid produced. No. 2,277,046. Karl M. Herstein to Acrolein Corp.

A thixotropic composition of matter comprising an aqueous dispersion of water-insoluble metallic resinate, calcium proteinate, and a trace of lime. No. 2,277,048. Martin Leatherman.

Method of treating oil bearing proteinacious materials comprising subjecting the material to increasing pressure in a continuously acting high pressure screw press to thereby separate oil from cake fragments which are at a temperature sufficiently high to cause deterioration and without appreciable loss of heat immersing the hot cake fragments in water for a predetermined period to thereby simultaneously cool them and increase their moisture content. No. 2,277,055. Orlin S. Anderson to V. D. Anderson Co.

A liquid for entrainment by gas to be delivered to a torch containing compounds selected from the group of volatile halides and compounds selected from group of volatile boron compounds. No. 2,277,064. Jerome M. Bialosky and Menahem Merlub-Sobel to William L. Ulmer.

Method separating liquids and gases. No. 2,277,070. Samuel C. Carney to Phillips Petroleum Co.

Method of cooling hot mineral granular materials comprising step of conducting heated granules and hot gases associated therewith into the form of an extended stream, causing the stream to flow in contact with impermeable enclosing walls of heat conductive material, withdrawing said gases, introducing a cooling stream of gas inert to such hot mineral material into stream, and circulating cooling water in contact with outside surface of said enclosing walls. No. 2,277,073. Clarence L. Colbert to Fiske, Brick & Granule Co.

Apparatus for purification of liquids by electro-osmosis. No. 2,277,091. Alfred H. Feyens.

Process for producing pure benzene hydrocarbons. No. 2,277,115. Hugo Kruger, Kreis Waldenburg and Kurt Gieseler to Sherka Chemical Co.

Process polymerizing oil extracted from the genus Coffea which comprises the steps of: halogenating said oil, and thereafter treating with a polymerizing agent selected from the group consisting of alkalies, polybasic acids, and aldehydes. No. 2,277,252. Herbert S. Polin, Albert I. Nerken to Coffee X Corp.

Method preventing flow or seepage from bodies of water which comprises forming and supporting and confining across the water path a compact blanket of finely-divided, substantially dry swellable bentonite of sufficient thickness and bentonite concentration to swell adjacent its face upon contact by the water and form across said path a water-impervious barrier of swollen bentonite merging into a reserve mass of substantially unswollen bentonite. No. 2,277,286. Paul Bechtner to American Colloid Co.

Process recovering organic acids from alkali solutions containing salts of same which comprises: neutralizing with sulfur dioxide an aqueous alkali solution containing alkali metal salts of phenols whereby there is formed an aqueous layer and an oily layer containing free phenols and carboxylic acid salts, separating the oily layer from the aqueous layer, separating carboxylic acid salts from the oily layer, and recovering carboxylic acids from said carboxylic acid salts. No. 2,277,315. Lionel S. Galstaun to Tide Water Associated Oil Co.

Process for producing a clear liquid petroleum ether solvent-extracted tung oil which comprises subjecting petroleum ether solvent-extracted tung oil to a temperature of at least 200° C. for substantially 30 minutes. No. 2,277,342. Robert S. McKinney, William G. Rose and Andrew F. Freeman.

In process for producing organic reaction product of an alkali metal compound difficultly soluble in organic solvents and an organic compound, the improvement which comprises dissolving the alkali metal compound in an alcoholic hydrogenation product of furfurol and carrying out the reaction of said alkali metal compound with said organic compound in the presence of said alcoholic hydrogenation product as a solvent for the reagents. No. 2,277,359. Erik Schirm, Richard Hueter and Heinz-Joachim Engelbrecht to "Patchem A.-G. zur Beteilgung an Patenten und Sonstigen Erfindungsrechten auf Chemische Verfahren."

In method of treating a shaped article comprising petroleum coke and a pitch binder to prevent said article of similar composition when the articles are subjected to heating operation in contact with each other at a temperature such that the pitch binder is caused to carbonize, the step which comprises rubbing powdered graphite on the surface of the article while maintaining the temperature of the article at a point between the softening point and the melting point of the pitch binder. No. 2,277,362. Edward Cole to The Dow Chemical Co.

Method recovering a solvent from vegetable and animal oils in which it is dissolved, which comprises in combination heating the oil containing the dissolved solvent while under vacuum to cause vaporization of the solvent and absorbing these vapors in the oil which is likewise under vacuum and which is at a substantially lower temperature than that at which the oil containing the solvent is heated and then subjecting the oil in which these vapors are adsorbed to solvent extraction with the same solvent. No. 2,277,401. Kenneth Hickman to Distillation Prods. Inc.

Process of treating nuts to soften the shells thereof, which comprises treating said nuts to the action of chlorine in the presence of a catalyst chosen from a class consisting of aluminum chloride, ferric chloride, antimony pentachloride, sulfur monochloride, thionyl chloride, phosphorus pentachloride, and phosphorus trichloride, while controlling the reaction to prevent attack of the kernels of said nuts. No. 2,277,485. Charles Frazier.

Solid catalyst comprising an anhydrous aluminum halide promoted by and supported upon crystalline alumina alpha monohydrate prepared by partial dehydration of crystalline alpha alumina trihydrate precipitated from a solution of sodium aluminate. No. 2,277,512. Martin de Simo and Frank McMillan to Shell Development Co.

Process for the production of n-butylene which comprises exposing to temperatures exceeding 400° C. but not substantially exceeding 700° C. a gas selected from the group consisting of vaporized tertiary butyl chloride and mixtures of isobutylene and hydrogen chloride in the presence of a solid catalyst promoting the splitting off of hydrogen chloride cooling the treated material to a temperature at which iso-butylene and hydrogen chloride form tertiary butyl chloride, and recovering n-butylene from tertiary butyl chloride and hydrogen chloride. No. 2,277,650. Martin Mueller-Cunradi and Adolf Cantzler and Hans Krekeler to General Aniline & Film Corp.

Leather

Tanning composition comprising a silicic acid sol containing a soluble aluminum compound and an amide. No. 2,276,314. Joseph Kirk to E. I. du Pont de Nemours & Co. Inc.

Tanning composition comprising a silicic acid sol and a water-soluble organic hydrogen bonding donor compound. No. 2,276,315. Joseph Kirk to E. I. du Pont de Nemours & Co. Inc.

Metals, Alloys

Method making composite articles of hardenable steel and mild steel comprising compressing a mass of iron powder containing combined carbon in sufficient amount to produce a mild steel upon sintering in contact with a mass composed of iron powder containing a higher percentage of combined carbon to render the same coherent heating at temperature above the critical range of steel of the composition of said latter mass and continuing the heating until the combined carbon in the latter mass is substantially uniformly diffused into said mass. No. 2,275,420. Frances H. Clark and Robert F. Dirkes.

Mold for forming articles from molten metal, said mold being formed of alloy steel showing a composition comprising: molybdenum 3.00-3.50%; carbon 0.5-.25%; manganese .25-.45%; and the balance iron with normal impurities and deoxidizers. No. 2,275,785. Russell H. McCarroll and Edgar C. Jeter to Ford Motor Co.

Method producing insulating layer on an oxidizable metal base. No. 2,275,952. George S. P. Freeman to Electric & Musical Industries Ltd.

Preparation of lead-sodium alloys. No. 2,276,031. E. Parmelee and Joseph L. Stecher to E. I. du Pont de Nemours & Co.

Method of making ferro-alloys. No. 2,276,074. James C. Vignos to Ohio Ferro-alloys Corp.

Art of treating and coating metals. No. 2,276,101. Julian L. Schueler.

Preformed alloy for addition to molten cast iron containing about 0.10 to 10% carbon, about 10 to 65% chromium, about 2 to 50% manganese, about 5 to 50% silicon, and an effective amount up to about 20% calcium, the balance being substantially all iron except for incidental impurities. No. 2,276,287. Henry T. Chandler to Vanadium Corp. of America.

Process treating surface of a metal included in the group consisting of iron, steel, zinc, aluminum and their alloys. No. 2,276,353. John Thompson to Parker Rust Proof Co.

Reissue. In primary cell, the combination with a magnesium electrode of a co-operating electrode and an electrolyte, said electrolyte essentially comprising two compounds in each of which the magnesium is separately passive, one of said compounds being chromic acid and the other of said compounds being a fluoride having the property of causing the magnesium to lose its passivity in respect to the chromic acid during current flow. No. 22,053. Samuel Ruben.

Method producing low carbon chromium-containing iron alloys. No. 2,277,211. Hugh S. Cooper.

Method removing iron from a material containing oxides of both chromium and iron. No. 2,277,220. Andrew J. Gailey to Electro Metallurgical Co.

Process for casting a non-ferrous metal which comprises flowing a stream of molten metal through an atmosphere of an alkali metal vapor into a mold and then contacting the mold with a bath of liquid alkali metal. No. 2,277,268. Gustave W. Goerner to E. I. du Pont de Nemours & Co.

An alloy consisting of 99.75 per cent lead and .25 per cent antimony. No. 2,277,627. George Bouton and Earle Schumacher to Bell Telephone Laboratories, Inc.

Process forming a negative electrode for an alkaline electric accumulator of the kind referred to which consists in preparing a nickel plate free from manganese and magnesium and containing at least 99.4% nickel, not more than 0.5% cobalt, not more than 0.1% iron, not more than 0.02% copper, not more than 0.02% carbon and not more than 0.02% silicon, and subjecting the said plate to an annealing in a hydrogen atmosphere at a temperature of at least 1250° C. whereby to remove oxygen and sulfur and give the plate a homogeneous crystal structure. No. 2,277,636. James Drumm and Albert Burnell to Drumm Battery Company Ltd.

Paints, Pigments

White pigment and process of preparing same. No. 2,275,856. Ekbert Lederle and Rudolf Brill.

Iron blue pigment. No. 2,275,929. Paul A. Thomasset to Ansbacher Siegle Corp.

Lead aluminate pigment and paint and method of making same. No. 2,277,061 and 2,277,062 and 2,277,063. Louis E. Barton.

U. S. Chemical Patents

Off. Gaz.—Vol. 536, Nos. 2, 3, 4—p. 346

Process of coating zinc oxide pigment which consists in applying to separate individual particle of the pigment a plurality of ingredients capable of reacting with each other to produce a synthetic resin and causing said ingredients to react in situ with each other while on the separate particles and produce thin separate coating films of a synthetic resin on the individual particles. No. 2,277,393. Harlan Depew to American Zinc, Lead & Smelting Co.

Paper, Pulp

Waterproof and Greaseproof paper. No. 2,276,244. Harry C. Fisher and James F. Thompson to The Gardner-Richardson Company.

Petroleum

Process producing motor fuel of high anti-knock value and relatively low olefin content. No. 2,275,441. Elmer R. Kanhofer to Universal Oil Products Co.

Process preparing viscosity index improving addition agents for lubricating oil which comprises condensing a wax-substituted aromatic hydrocarbon with less than about 0.2 gram mol of a dicarboxylic acid halide per 100 grams of the wax-substituted aromatic hydrocarbon in the presence of not substantially more than 2 mols of a Friedel-Crafts catalyst per mol of dibasic acid halide, at a temperature not substantially above 80°C. hydrolizing the catalyst and distilling the condensation product to obtain a distillation residue having viscosity index improving properties. No. 2,275,447. Eugene Lieber and Louis A. Mikeska to Standard Oil Development Co.

Conversion process which comprises combining hydrocarbon oil heavier than gasoline with hydrocarbons boiling in the gasoline range, formed as hereinafter set forth, subjecting the resultant mixture to the action of a cracking catalyst, at a temperature in the approximate range of 600-900°F., separating gasoline from insufficiently converted oil, catalytically cracking at least a portion of the latter at higher temperature than said mixture to convert a substantial portion thereof into gasoline, and combining heavier fractions of the last-named gasoline with said hydrocarbon oil as aforesaid. No. 2,276,081. Edwin H. McGrew to Universal Oil Products Company.

Process for the production of motor and aviation gasolines. No. 2,276,103. Jean Delattre Seguy to Universal Oil Products Company.

Suppression of metal catalysis. No. 2,276,158. Joseph A. Chenicek to Universal Oil Products Co.

Mineral oil composition comprising a viscous hydrocarbon oil normally tending to deteriorate in service and having incorporated therewith deterioration inhibiting proportions of di-alpha naphthylamine. No. 2,276,162. Philip G. Colin to Tide Water Associated Oil Co.

Process for producing hydrocarbons boiling in the gasoline range which comprises reacting a butane with acetylene in the presence of aluminum chloride and hydrogen chloride at a temperature in excess of 0°C. but not appreciably above 50°C. and under sufficient superatmospheric pressure to maintain a substantial portion of the butane in liquid phase. No. 2,276,189. Aristic V. Grosse and Carl B. Linn to Universal Oil Products.

Production of iso-octane. No. 2,276,199. Louis S. Kassel to Universal Oil Products Co.

Conversion of hydrocarbon oils. No. 2,276,249. Jacque C. Morrell to Universal Oil Products Co.

Alkylation of hydrocarbons. No. 2,276,250. Jacque C. Morrell to Universal Oil Products Co.

Alkylation of Hydrocarbons. No. 2,276,251. Jacque C. Morrell to Universal Oil Products Company.

Method of synthesizing hydrocarbons. No. 2,276,274. Percival C. Keith, Jr. to The M. W. Kellogg Co.

Production of manufactured gas and valuable hydrocarbons by the thermal cracking of fluid hydrocarbons in vapor phase. No. 2,276,288. Newcomb K. Chanley to The United Gas Improvement Co.

Lubricating composition comprising a hydrocarbon oil, from about .1% to about 5% of a naphthenate, and a separate halogenated organic compound. No. 2,276,341. Carl Prutton to The Lubri-Zol Development Corp.

Process recovering hydrocarbon oils and gases from oil-shale which comprises enclosing a mass of oil-shale in a reaction retort upon a base of coal, then passing superheated steam through the coal and oil-shale to effect decomposition thereof and in a manner whereby the decomposition products from the coal pass through the mass of oil-shale and finally withdrawing and condensing the said products. No. 2,276,342. Elmer Records and James Louttit.

In process of refining a hydrocarbon oil selected from the group consisting of lubricating and electrical oils free from asphalt containing harmful sulfur in form of mercaptan sulfur, the steps comprising heating said oil in liquid state at a temperature from about 400° F. to 700° F. with at least 1 mol cuprous oxide per mol of said mercaptans under non-oxidizing conditions to convert mercaptan sulfur to cuprous sulfide and substantially to prevent conversion of mercaptans to disulfides. No. 2,276,526. George H. vonFuchs and Hilbert H. Zuidema to Shell Development Co.

Polymerization of olefins to high molecular weight hydrocarbon polymers. No. 2,276,893. Robert M. Thomas and Irving E. Lightbown to Standard Oil Development Co.

Lubricating composition comprising a lubricating hydrocarbon oil blended with a minor proportion of a chemically combined addition product of a high molecular weight unsaturated polymeric hydrocarbon and an alkyl hypochlorite. No. 2,276,956. Anthony H. Gleason and William J. Sparks to Standard Oil Development Co.

Resins, Plastics

Stabilization of superpolymers. No. 2,275,620. Calvin S. Fuller to Bell Telephone Labs., Inc.

Oil soluble phenolic resin and method of making same. No. 2,275,865. Israel Rosenblum.

Composite product consisting of a film of a vinyl resin superficially bonded by the application of heat and pressure to a paper which has a dense and substantially non-porous surface, the bond between said film of vinyl resin and said paper being easily frangible at ordinary temperatures without detriment to either the vinyl resin film or the paper. No. 2,275,957. Frazier Groff to Carbide and Carbon Chemicals Corp.

Condensation products of rosin and rosin esters and method for the production thereof. No. 2,275,986. Arthur L. Osterhof to Hercules Powder Co.

Process for producing resinous products. No. 2,275,989. Eugene R. Perry to Westinghouse Elec. & Mfg. Co.

Treatment of substantially solid resinous linear condensation polymers. No. 2,276,030. Archie L. Dubeau, James D. MacMahon and George P. Vincent to The Mathieson Alkali Works, Inc.

Polymer of a vinylaryl ester, the vinylaryl group of which is hydrocarbon. No. 2,276,138. Van Vernon Alderman and William Edward Hanford to E. I. du Pont de Nemours & Company.

Alkylol cyanamide-polycarboxylic acid condensation product. No. 2,276,231. Walter P. Ericks to American Cyanamid Co.

Homogeneous alcohol solutions containing resins. No. 2,276,267. Theodore F. Bradley to American Cyanamid Co.

Composition of matter comprising a resinous extract derived from long leaf yellow pine trees, said extract consisting essentially of oxidized abietic acid and having corn protein dissolved therein. No. 2,276,304. James H. Hunter to Radio Corporation of America.

Organic solvent dry casting solution of polyvinyl acetal containing 0.5% to 5% (based on the solids content of the casting solution) of alkylamine salt of a fatty acid containing 12 to 20 atoms. No. 2,276,305. Albert Hershberger to E. I. du Pont de Nemours & Co.

Formaldehyde-polyalkylene polyamine condensation products and production thereof. No. 2,276,309. Hans G. Hummel and Michael Jahrstorfer to General Aniline & Film Corp.

Synthetic linear polyamide plasticized with an alkylaryl sulfonamide. No. 2,276,437. Gordon Vaala to E. I. du Pont de Nemours & Co. Inc.

Production of a styrene-type polymerization product by subjecting a monomeric hydrocarbon of the group consisting of styrene and methylstyrene to polymerizing conditions together with an ester derived from crotonic acid and a saturated monohydric alcohol having from 6 to 12 carbon atoms in the molecule. No. 2,276,596. Herbert M. Stanley and Hanns P. Staudinger.

Method for continuous polymerization of polymerizable organic compounds to produce elongated solid articles of desired length. No. 2,276,691. Donald L. Gibb to The Dow Chemical Co.

Resinous reaction products of aliphatic aldehydes and nitrogen-containing methylene compounds. No. 2,276,828. Gaetano F. D'Alelio to General Electric Co.

Polymer of an N-vinylamide of an aromatic dicarboxylic acid having its two carboxyl groups on adjacent ring carbons. No. 2,276,840. William E. Hanford and Halsey B. Stevenson to E. I. du Pont de Nemours & Co.

An article composed of polymerized isobutylene characterized by a molecular weight above 30,000 having a surface coating thereon of chlorinated poly-isobutylene characterized by a hardened non-sticky surface, a percentage content within the range of 20% to 50% by weight of chlorine and a substantial thickness of less than about 1/100 inch. No. 2,276,951. Harold W. Fisher to Standard Oil Development Co.

Resins, Plastics

Process treating at 20-150° C., a hydroxylated polyvinyl resin with 0.1%, based on the weight of the resin, of an aliphatic disocyanate. No. 2,277,083. George L. Dorough to E. I. du Pont de Nemours & Co.

Process making polyamides which comprises heating a linear polycarbonam de-forming composition comprising a bifunctional polycarbonamide-forming reactant containing at least one formylamino group. No. 2,277,125. Elmore L. Martin to E. I. du Pont de Nemours & Co.

Process producing highly polymeric linear polyamides, which comprises heating at polyamide-forming temperatures a N-acyl-derivative of a substance selected from class consisting of monoamino-monocarboxylic acid, the esters, lactams, chlorides and amides of said acid, the chain between the amino and carboxyl groups in said acid having at least 5 carbon atoms and being free from reactive groups, the acyl radical in said N-acyl derivative being that derived by removal of hydroxyl group from a carboxylic acid. No. 2,277,152. Paul Schlack to E. I. du Pont de Nemours & Co.

Plastic polyvinyl alcohol compositions. No. 2,277,259. Ernst Schnabel and Charles Dangelmajer to Resistoflex Corp.

Resin-forming thioammeline ether ketone and process for preparing same. No. 2,277,267. Herman A. Bruson to The Resinous Products & Chemical Co.

Process for producing stabilized rosin consisting of heating one of the group consisting of rosin and pine oleoresin at temperatures ranging between 300° C.-400° C. under at least 300-lb. pressure per square inch until substantially all the rosin has been converted into a stable form, thence distilling off the volatile fraction present and thence recovering residue as a stabilized rosin. No. 2,277,351. Wm. D. Pohle, Wiley C. Smith to Claude R. Wickard.

Acetoacetic ester-formaldehyde resins. No. 2,277,479. Gaetano D'Alelio to General Electric Co.

Condensation product of ingredients consisting essentially of the following components in the stated molar ratios: (1) one mole urea, (2) at least one mole of formaldehyde and (3) a small amount not exceeding substantially one-fourth mole of a chlorinated acetaldehyde. No. 2,277,480. Gaetano D'Alelio to General Electric Co.

Method of removing peroxide- and metal compound-containing catalyst residues and low molecular weight polymers from a polymeric material selected from the class consisting of polymeric vinyl halides, polymeric vinylidene halides, co-polymers of vinyl halides which are insoluble in and recoverable from acid aqueous lower aliphatic alcohols and acid aqueous lower aliphatic ketones, and co-polymers of vinylidene halides which are insoluble in and recoverable from acid aqueous lower aliphatic alcohols and acid aqueous lower aliphatic ketones. No. 2,277,504. Ralph Wiley to The Dow Chemical Co.

Rubber

Method of chlorinating rubber which comprises reacting gaseous chlorine with rubber dispersed in dilute anhydrous solution while said solution is in contact with metallic copper. No. 2,275,469. James W. Raynolds and George A. Webb to The Raolin Corp.

U. S. Chemical Patents
Off. Gaz.—Vol. 536, Nos. 2, 3, 4—p. 346

U. S. Chemical Patents

Off. Gaz.—Vol. 536, Nos. 2, 3, 4—p. 347

Method coating films of rubber hydrochloride which comprises coating a film of rubber hydrochloride with a hot melt composition comprising 94 to 70% by weight of a wax and 6 to 30% by weight of rubber simultaneously heating and stretching said coated film to reduce thickness of said film and coating while maintaining continuity of said coating. No. 2,275,814. Allen Abrams and George W. Forcey and Charley L. Wagner to Marathon Paper Mills Co.

Process for preparation of modified rubber derivatives or resins consisting in reacting maleic anhydride with rubber and a compound selected from the group consisting of styrene, vinyl acetate and a methacrylic ester in solution in presence of a catalyst or condensing agent and maintaining mixture at a temperature of 70 to 100°C. for a period of several hours. No. 2,275,951. Ernest H. Farmer to The British Rubber Producers' Res. Assoc.

Process of reclaiming rubber. No. 2,276,248. Walter G. Kirby to United States Rubber Co.

Process inhibiting the deterioration of organic substances. No. 2,276,932. Clyde Coleman to United States Rubber Co.

Process producing vulcanized rubber products which comprises incorporating in rubber prior to vulcanization thereof, a compound having a parent nucleus composed of one nitrogen atom joined to itself by a series of at least five and not more than six ring carbon atoms, all of the said carbon atoms being members of but one ring system and having a ring carbon atom adjacent the nitrogen joined to a non-nuclear sulfur atom. No. 2,276,975. Louis H. Howland to United States Rubber Co.

Method producing an improved latex which comprises removing salts from a natural latex until the natural ash content does not exceed .15% of the total solids of said latex and reducing the pH of the latex to below about 3.5. No. 2,276,986. Archie R. Kemp and William G. Straitiff to Bell Telephone Labs. Inc.

Textiles

Treatment of textiles and other shaped articles made of cellulose derivatives. No. 2,275,513. Henry Dreyfus to Celanese Corp. of America.

Textile printing paste comprising a viscous aqueous solution of about 1.5% to 5% of a thickening agent selected from group consisting of water-soluble methyl cellulose, water-soluble ethyl cellulose, sodium polyacrylate, locust bean gum, sodium alginate, gum tragacanth, and gum karaya and having uniformly dispersed in said solution 1% to 10% of a finely divided water-insoluble coloring material and about 2.5% to 15% of a water-insoluble resin which forms a film when deposited from an aqueous dispersion. No. 2,275,991. Donald H. Powers and Sivert N. Glarum to Rohm & Haas Co.

Process which comprises applying to a fabric a coating of dust of plaster of Paris, then applying thereto an aqueous suspension of rubber, then washing off a part of the aqueous suspension of rubber with the same aqueous suspension of rubber but diluted with water to leave only a thin film on the fibres leaving the mesh open and the nap relatively uncoated, and drying the fabric so that in the finished product the said fibres are covered with only a thin rubber film leaving the mesh open. No. 2,276,415. Alan Murray.

Thickening agent for printing and discharging pastes. No. 2,276,704. Alwin Schneevoigt and Julius Beck to General Aniline & Film Corp.

Process for improving properties of staple fibres having a basis of an organic derivative of cellulose and produced by cutting filamentary materials, which comprises subjecting the fibres, while in a condition in which they are substantially free to contract, to the action of a medium which comprises a latent solvent for the cellulose derivative and which is substantially free from water. No. 2,277,086. Henry Dreyfus to Celanese Corp. of America.

Process for crimping artificial staple fibre made of or containing an organic derivative of cellulose which comprises subjecting the fibres, while they are substantially free to contract, to the action of a shrinking medium containing acetaldehyde and a diluent selected from the group consisting of water and alcohols. No. 2,277,093. Donald Finlayson and Richard G. Perry to Celanese Corp. of Amer.

Process for crimping of artificial staple fiber made of an organic derivative of cellulose, which comprises subjecting staple fiber, while in a condition in which the individual fibers are substantially free to contract, to the action of a medium comprising ethyl acetate, water and ethyl alcohol. No. 2,277,163. Percy F. C. Sowter and Richard G. Perry to Celanese Corp. of Amer.

Method crinkling staple fiber having a basis of an organic derivative of cellulose, which comprises subjecting said staple fiber to the action of a medium comprising a lower aliphatic alcohol and a chlorinated hydrocarbon selected from the group consisting of trichlorethylene, dichlorethylene and carbon tetrachloride, while the fibers are substantially free to contract. No. 2,277,164. Percy F. C. Sowter to Celanese Corp. of America.

Process for producing water-repellent textile materials and product therefrom. No. 2,277,174. Ernst Waltmann to Heberlein Patent Corp.

Process and compound for improving textile fabrics. No. 2,277,202. Karl Brodersen and Mathias Quaedvlieg to General Aniline & Film Corp.

Process of increasing the affinity for acid and direct dyestuffs of structures spun from a textile filament-forming composition comprised of an organic compound having a high degree of polymerization, which structures do not have a satisfactory affinity for said dyestuffs, which comprises dissolving in said filament-forming composition an aralkylated member of the group consisting of naturally-occurring proteins and deacetylated chitin, spinning said composition into filament structures, and treating said structures with an alkaline saponifying agent therefor. No. 2,277,486. Rudolf Gewehr to E. I. du Pont de Nemours & Co. Inc.

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Foreign Chemical Patents
British—p. 72

Abstracts of Foreign Patents

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Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. Your comments and criticisms will be appreciated.

BRITISH COMPLETE SPECIFICATIONS

Accepted and Published October 16, 1940

Manufacture of diazo-dyestuffs. No. 527,221. Durand & Huguenin A. G.
Treatment of highly ferruginous yellow ochre earth. No. 527,181. F. Kuki.
De-aeration of liquids such as feed water. No. 527,204. Hick, Hargreaves & Co. Ltd. et al.
Processes and machines for applying and drying adhesive. No. 527,211. E. G. Staude.
Production of alcohol from olefines. No. 527,316. E. I. du Pont de Nemours & Co., Inc.
Manufacture of thiolactams. No. 527,317. Imperial Chemical Industries Ltd.
Separation of amino acids from acid hydrolysates of proteins. No. 527,320. G. Toennies.
Method for the production of hydrogen. No. 527,242. M. W. Kellogg Co.
Method for the production of hydrogen. No. 527,243. M. W. Kellogg Co.
Saponification of textile materials containing an organic ester of cellulose. No. 527,328. British Celanese Ltd.
Working up copper from copper and mud containing lime and cellulose. No. 527,338. British Bemberg Ltd.
Washing of precipitated magnesium hydroxide. No. 527,139. Ocean Salts (Products) Ltd.
Production of sensitive photographic emulsions. No. 527,283. Kodak, Ltd.

Accepted and Published October 23, 1940.

Hydration of vinyl acetylene. No. 527,423. Consortium fur Elektrochemische Industrie Ges.
Treating magnesia-containing lime stone. No. 527,425. Standard Lime & Stone Co.
Photographic emulsions and manufacture of dyes therefor. No. 527,627. Kodak, Ltd.
Color developers and process of color development. No. 527,493. Kodak, Ltd.
Manufacture of resinous products derived from acrylic acid derivatives. No. 527,494. Imperial Chemical Industries Ltd.
Production of sulfur-containing condensation products. No. 527,428. Silesia Verein Chemischer Fabriken.
Ventilation and air filtration plants. No. 527,631. A. C. G. Hesketh-Prichard.
Methods for the production of iron in powder form. No. 527,430. Association des Ouvriers en Instruments de Precision.
Process for the production of water-soluble, injectable compounds of sulfanilic acid amides. No. 527,499. F. Hoffmann-LaRoche & Co., A. G.
Method for obtaining medicinal substances from the sap of conifers. No. 527,503. L. Hofbauer.
Manufacture of improved lubricating materials. No. 527,366. E. I. du Pont de Nemours & Co., Inc.
Removing acid compounds from water-insoluble neutral or basic organic liquids. No. 527,509. N. V. de Bataafsche Petroleum Mij.
Manufacture of chromable dyestuffs of the triarylmethane series. No. 527,369. I. G. Farbenindustrie A. G.
Production of materials for treating animal and vegetable oils for retarding oxidation and the development of rancidity. No. 527,381. Distillation Products, Inc.
Apparatus for separating liquids from solids. No. 527,384. Dorr Co., Inc.
Generation of acetylene. No. 527,391. I. G. Farbenindustrie A. G.
Process for the manufacture of condensation products from trimethylhydroquinone and alkylene halides. No. 527,396. F. Hoffmann-LaRoche & Co. A. G.
Separation of an azeotropic vapor mixture containing alkyl phenols. No. 527,402. N. V. de Bataafsche Petroleum Mij.
Synthetic resinous compositions. No. 527,407. British Thomson-Houston Co. Ltd.
Polyvinyl resin composition. No. 527,408. British Thomson-Houston Co. Ltd.
Metal alloys. No. 527,409. British Thomson-Houston Co. Ltd.
Production of amide condensation resins. No. 527,414. Albert Products, Ltd.
Production of chemical wood pulp. No. 527,415. Pangara Holding Corporation.
Method and apparatus for continuously removing oleaginous and foreign substances from webs of fibrous material. No. 527,416. M. T. Stevens & Sons Co.
Reclaiming of rubber from vulcanized products. No. 527,417. I. G. Farbenindustrie A. G.
Production of hydroxy organic acids or derivatives thereof. No. 527,643. E. I. du Pont de Nemours & Co., Inc.
Production of substituted acetic acids. No. 527,644. E. I. du Pont de Nemours & Co., Inc.
Production of substituted acetic acid. No. 527,645. E. I. du Pont de Nemours & Co., Inc.
Astringent preparation. No. 527,439. J. B. Montemier.
Extrusion apparatus. No. 527,446. Templewood Engineering Co., Ltd.
Preparation of impermeable corrosion-resisting coatings. No. 527,467. C. F. Lumb.
Chromite refractory materials. No. 527,470. G. E. Seil.
Catamenial device. No. 527,474. G. S. Millard.
Production of glass or other fibres. No. 527,475. Algemeene Kunstvezel Mij. N. V.
Process for producing compositions or concentrates containing one or more components of the vitamin-B complex. No. 527,478. Commercial Solvents Corporation.
Preparation of a soap. No. 527,479. Hercules Powder Co.
Treatment of textile materials with synthetic resins. No. 527,520. Rohm & Haas Co.
Spinning of artificial filaments or films. No. 527,532. E. I. du Pont de Nemours & Co., Inc.
Method of producing a material for surface covering and fire protection. No. 527,534. N. E. Olsson.
Catalytic conversion of hydrocarbon oils. No. 527,555. M. W. Kellogg Co.
Producing acetyl cellulose soluble in various organic solvents. No. 527,565. I. Sakurada and M. Taniguchi.
Silicon Alloys. No. 527,579. Electro Metallurgical Co.
Tanning hides and skins. No. 527,590. A. Ferretti.
Protective layers for the interior of pipes and like hollow bodies. No. 527,601. Deutsche Eisenwerke A. G.
Refining hydrocarbon oils. No. 527,609. H. E. Newton.
Method of removing poison from tobacco smoke. No. 527,648. K. Skumburdis.
Drying webs. No. 527,660. B. Offen.
Process for the manufacture of phosphoric acid dichlorides of 4-aminobenzene-sulfonamide. No. 527,548. F. Hoffmann-LaRoche & Co. A. G.
Production of sintered bodies of light metal. No. 527,618. Deutsche Gold und Silber-Scheideanstlt vorm. Roessler.
Separation of aminoacids from acid hydrolysates of proteins. No. 527,485. G. Toennies.

BRITISH COMPLETE SPECIFICATIONS

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Lubricants. No. 527,695. Wakefield & Co., Ltd. and E. A. Evans.
Manufacture of electric cables. No. 527,763. Imperial Chemical Industries, Ltd. and J. C. Swallow and M. W. Perrin.
Manufacture of melamine. No. 527,697. Society of Chemical Industries in Basle.
Magnesium titanate base pigments and method of making same. No. 527,700. Titanium Alloy Manufacturing Co.
Molding articles from synthetic resins. No. 527,906. Ebonestos Industries, Ltd. and A. Amigo.
Process and apparatus for treating fluids. No. 527,908. Infilco, Inc.
Filtration of liquids. No. 527,911. B. Sander and K. Aschner.
Treatment of material made of or containing an organic derivative of cellulose. No. 527,834. Kodak, Ltd.
Isomerization of low molecular paraffinic hydrocarbons. No. 527,767. I. G. Farbenindustrie A. G.
Apparatus for producing foam for fire extinguishing purposes. No. 527,769. Foamite, Ltd., V. G. W. Gilbert and H. P. Pitstow.
Preparation of mixed fatty acid esters of cellulose. No. 527,973. Kodak, Ltd.
Manufacture of sulfuryl chlorofluoride. No. 527,713. Imperial Chemical Industries and T. B. Gowland.
Manufacture of hydrocarbons, and particularly the alkylation of hydrocarbons. No. 527,720. Texaco Development Corporation.
Applying cellulose derivative lacquers. No. 527,729. Commercial Solvents Corporation.
Preparation of colloidal suspensions. No. 527,974. E. G. Acheson, Ltd. and L. G. Scott.
Method of increasing the aromatic content of hydrocarbons. No. 527,975. M. W. Kellogg Co.
Production of gas-expanded rubber material or rubber-like material. No. 527,736. Expanded Rubber Co., Ltd. and A. Cooper.
Production of sodium aluminate products. No. 527,979. Alfloc, Ltd.
Injection molding. No. 527,738. Celluloid Corporation.
Clarifying sugar juices. No. 527,747. Mirrlees Waltson Co., Ltd. and T. Storrar.

Foreign Chemical Patents
British—p. 72

9 M 3/30

Foreign Chemical Patents

British—p. 73

Galvanically coating articles of aluminum or aluminum alloys. No. 527,754. Vereinigte Aluminum-Werke A. G.
Process for the manufacture of therapeutically employable preparations of Vitamin K. No. 527,798. Roche Products, Ltd.
Manufacture of bacterial antigenic and/or immunogenic preparations. No. 527,803. Glaxo Laboratories, Ltd. et al.
Polymerization of unsaturated hydrocarbons. No. 527,805. N. V. de Bataafsche Petroleum Mij.
Telescopic gasholders. No. 527,807. C. & W. Walker, Ltd. et al.
Aluminum alloys. No. 527,819. W. Mills, Ltd. et al.
Air purifying elements and air purifying apparatus. No. 527,851. Mine Safety Appliances Co.
Patch for repairing and reinforcing textile articles. No. 527,852. J. M. Souris Fontanals.
Method of preparing finely comminuted oxides. No. 527,855. Corning Glass Works.
Tinted glass. No. 527,757. Corning Glass Works.
Production of composite materials. No. 527,857. Bakelite Building Products Co., Inc.
Recovery of flue gas ash with a high concentration of metals or metallic compounds. No. 527,863. N. V. de Bataafsche Petroleum Mij.
Production of readily soluble calcium salts. No. 527,864. G. A. R. von Wulfing and E. M. H. Rosskothen.
Alloys. Nos. 527,865 and 527,866. Handy & Harman.
Operation of producer gas-fired coke ovens or retorts. No. 527,875. Power-Gas Corporation, Ltd. et al.
Method of freezing fresh fruit and storing the same in frozen condition. No. 527,876. L. Van Cleef.
Machines for molding plastic material. No. 527,879. Lauterbach Corporation.
Mold charging mechanism for plastic molding machines. No. 527,984. Lauterbach Corporation.
Lacquer composition comprising chlorine-containing rubber. No. 527,883. Hercules Powder Company.
Treatment of regenerated cellulosic materials. No. 527,888. Calico Printers' Association, Ltd.
Reaction products of rubber and solutions of such products. No. 527,935. Manchester Oxide Co., Ltd. et al.
Gas expanded material. No. 527,951. Expanded Rubber Co., Ltd.
Production of binding agents. No. 527,894. K. E. W. Oesterreich.
Preparing saturated hydrocarbons with branched or more highly branched chains from saturated hydrocarbons. No. 527,954. N. V. de Bataafsche Petroleum Mij.
Preparing very strong artificial silk by the funnel stretch-spinning method. No. 527,965. British Bemberg, Ltd.
Waterproof pellicles and composition for preparing the same. No. 527,985. Sylvania Industrial Corporation.
Tires for vehicle wheels. No. 527,989. J. V. Martin.
Process and apparatus for continuously crystallizing sugar and similar solutions. No. 527,992. Werkspoor N. V.
Resinous compositions and method of making them. No. 527,993. British Thomson-Houston Co., Ltd.
Pneumatic tire covers for vehicle wheels. No. 527,995. Societa Italiana Pirelli.
Method of making luminescent substances adhere to glass walls. No. 528,004. Société Anonyme pour les Applications de l'Electricité et des Gaz Rares Etablissements C. Paz & Silva.
Aggregate for use in the manufacture of concrete. No. 528,008. A. Taylor.
Method of stiffening fabrics. No. 528,024. T. L. Shepherd.
Manufacture of ferromagnetic material. No. 528,025. Steatit-Magnesia A. G.
Internal sanitary pad or tampon. No. 527,827. T. G. Galway.
Machines for the production of tablet glasses, ampoules, etc. No. 528,031. J. Dichter.

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Method for the preparation of progressively burning smokeless powder. No. 528,035. Hercules Powder Co.
Production of films or sheets of cellulose derivatives. No. 528,107. Kodak, Ltd.
Electrolytic processes and bath. No. 528,240. J. S. Nachtman.
Treatment of fibrous materials. No. 528,244. Papeteries de Belgique S. A. et al.
Isomerisation of normal paraffins. No. 528,178. Anglo-Iranian Oil Co., Ltd.
Electrolytic production of manganese. No. 528,112. F. W. Atack.
Apparatus for degreasing non-absorbent articles. No. 528,184. Imperial Chemical Industries, Ltd. et al.
Preparing acetylated styrenes and the products resulting therefrom. No. 528,312. Armour & Co.
Stapling artificial fibres. No. 528,045. Phrix-Arbeitsgemeinschaft.
Method of making steel. No. 528,185. United States Steel Corporation.
Manufacture of light metal cartridge cases. No. 528,114. Aluminum-Industrie A. G.
Compressing and briquetting of raw materials. No. 528,117. Dorstener Eisengiesserei und Maschinenfabrik A. G.
Dyeing with sulfur dyestuffs. No. 528,118. Society of Chemical Industry in Basle.
Paper-sizing media and processes for their production. No. 528,048. M. Wieger (née Marschalleck) and H. Grasshof.
Production of patterned cellulose fabrics. No. 528,048. Aktien-Gesellschaft Cilander.
Manufacture of modified olefine resins. No. 528,051. E. I. du Pont de Nemours & Co., Inc.
Horticultural fungicidal compositions. No. 528,054. Imperial Chemical Industries, Ltd. et al.
Production of colored finishes on artificially produced oxide films on light metals. No. 528,314. British Anodising, Ltd. et al.
Cigarette paper. No. 528,190. E. O. Whiteley.
Composite structures comprising plastic material. No. 528,062. De Havilland Aircraft Co., Ltd. et al.
Manufacture of polyhydric alcohols. No. 528,064. E. I. du Pont de Nemours & Co.
Zinc base alloy. No. 528,065. Imperial Chemical Industries, Ltd.
Process for the preparation of margarine and the like oil or fat and water emulsions, and apparatus therefor. No. 528,123. Girdler Corporation.
Apparatus for use in separating solid particles centrifugally from gaseous fluids. No. 528,194. J. Howden & Co., Ltd. et al.
Reclamation of waste rubber. No. 528,196. Rubber Improvement, Ltd. et al.
Manufacture of benzidine. No. 528,317. E. I. du Pont de Nemours & Co., Inc.
Regeneration of caoutchouc. No. 528,319. H. Ghez and O. Ghez.
Manufacture of sintered bodies from metal and other powders. No. 528,320. B. Berghaus.
Preparation of opaquing agents for white enamels. No. 528,321. Société de Produits Chimiques des Terres Bares.
Manufacture of dicarboxylic acids. No. 528,327. E. I. du Pont de Nemours & Co.
Cellulose derivative emulsions. No. 528,069. E. I. du Pont de Nemours & Co.
Degreasing apparatus. No. 528,080. A. H. Tod.
Pumps for producing a flow of conducting liquid. No. 528,091. General Electric Co., Ltd.
Method of preparing a fuel mixture. No. 528,093. H. Rupp.
Extreme pressure lubricants and process of preparing the same. No. 528,096. Armour and Co.
Gas supply arrangement for the ignition of firing carriages in sintering plants. No. 528,328. Gutehoffnungshutte Oberhausen A. G.
Preparation of thioamides and the products resulting therefrom. No. 528,103. Armour and Company.
Stabilized hypochlorite solutions and methods of preparing them. No. 528,125. Clorox Chemical Co.
Treatment of oils. No. 528,129. Permutit Co., Ltd. et al.
Molten inorganic salt bath for thermal treatment. No. 528,135. Pilkington Bros., Ltd.
Sizing of fibrous materials such as threads. No. 528,136. Société Sandor et al.
Softening or conditioning agents and methods of producing them. No. 528,138. Atlas Powder Company.
Apparatus for controlling the rate of flow of liquids. No. 528,143. W. F. Slater and G. T. W. Grieve.
Evaporators for producing pure distilled water from sea-water or other aqueous liquids containing impurities in solution. No. 528,145. Aktienbolaget Separator.
Resinous composition. No. 528,147. British Thomson-Houston Co., Ltd.
Easily water soluble salts of wool dyestuffs. No. 528,150. Sandoz, Ltd.
Apparatus for drying webs of fabric. No. 528,157. E. Gessner A. G.
Method of and apparatus for drying webs of fabrics. No. 528,158. E. Gessner A. G.
Production of amino acids. No. 528,162. Corin Products Refining Co.
Process for the disintegration of asbestos and the like fibres to prepare them for utilization in the manufacture of fibre-cement materials, and apparatus for carrying out said process. No. 528,163. S. A. Stabilimenti di Dalmine et al.
Methods for the removal of relatively volatile metals from their alloys with aluminum. No. 528,204. Calloy, Ltd. et al.
Copper alloy. No. 528,206. Kupperwerk Ilsenburg A. G.
Composite metal structures. No. 528,209. Mond Nickel Co., Ltd.
Production of protective layers on aluminum or aluminum alloys or magnesium or magnesium alloys. No. 528,234. Magnesium Electron, Ltd.
Production of zein. No. 528,255. Corn Products Refining Company.
Production of zein compositions. No. 528,256. Corn Products Refg. Company.
Manufacture of starch. No. 528,257. Corn Products Refining Company.
Production of dextrose. No. 528,258. Corn Products Refining Company.
Methods and apparatus for splicing rubber articles. No. 528,264. Wingfoot Corp.
Treatment of lignin and the products resulting therefrom. No. 528,268. E. C. Sherrard and E. E. Harris.
Method of and apparatus for drying printing ink containing a volatilizable inflammable solvent after such ink has been applied to a material. No. 528,270. Interchemical Corporation.
Apparatus for the treatment of synthetic fibres. No. 528,277. Rheinische Zellwolle A. G. et al.
Gas producer for use with solid fuels such as wood, peat, straw, etc. No. 528,264. G. H. Donald.
Making explosive compositions for detonating rivets. No. 528,299. Dynamit A. G. vormals A. Nobel & Co.
Deposition of alloys on a base metal by electric arc welding. No. 528,301. Seri Holding S. A.
Carbonization of carbonaceous material. No. 528,337. Institution of Gas Engineers et al.
Gasification of carbonaceous materials. No. 528,338. Institution of Gas Engineers et al.
Method and apparatus for forming rubber articles from latex. No. 528,340. Firestone Tyre and Rubber Co., Ltd.
Apparatus for producing continuous rubber articles. No. 528,342. Firestone Tyre and Rubber Co., Ltd.
Apparatus for cleaning and degreasing tins or the like. No. 528,347. Huntley & Palmers, Ltd. et al.
Treatment of fabrics for modifying their luster and other properties. No. 528,358. Tootal Broadhurst Lee Co., Ltd. et al.
Machine for preparing pneumatic tires for re-rubbering. No. 528,366. N. T. J. Collmann.
Paper and like bags and envelopes and the manufacture thereof. No. 528,368. Strachan & Henshaw, Ltd. et al.
Foam producing devices for fire extinguishing. No. 528,369. J. Muller.
Resolution of the racemic condensation product from phytyl halides and trimethyl hydroquinone. No. 528,371. F. Hoffmann-LaRoche & Co. A. G.
Process for the manufacture of condensation products from trimethyl hydroquinone and halides of alpha, beta-unsaturated carboxylic acids. No. 528,372. F. Hoffmann-LaRoche A. G.
Process for the manufacture of alkaline silicates in the powder form. No. 528,374. Floridienne J. Buttgenbach & Co. S. A.
Waterproofing emulsions and methods of preparing them. No. 528,308. Bakelite Building Products Co., Inc.
Injection molding machines. No. 528,171. E. Hempel.
Cellulose ester composition. No. 528,375. Kodak, Ltd.